Chapter 1 – Inventory of Existing Conditions

OVERVIEW

Palm Springs International Airport (PSP or the Airport) is a publicly owned airport located in Riverside County, California, two miles east of downtown Palm Springs, and within Colorado Desert's Coachella Valley. **Figure 1-1** and **Figure 1-2** show PSP's location and vicinity maps.

The Airport accommodates commercial service passenger aircraft, corporate business jets, military aircraft, and general aviation aircraft. The Airport attracts a wide variety of travel to the region that supports the local economy, primarily leisure travelers who want to unwind in a desert oasis. PSP has experienced significant aviation activity growth in recent years. The Airport enplaned approximately 1.5 million passengers in 2022 – essentially a fifty percent increase in enplanements over the last five years.

The Airport, along with its aviation-related businesses and facilities, represents a vital and significant economic asset. PSP provides benefits to local businesses and industries, supports tourism, and encourages additional business development and expansion throughout the Coachella Valley.

The most recent Airport Master Plan Update for PSP was approved in 2015. Since that time, there have been several changes that necessitate revisiting the recommendations identified in that plan, including significant increases in the number of annual and peak period passengers, changes to the commercial aircraft fleet, new routes, new air carriers, and changes to airport facilities. This Airport Master Plan Update will focus on the Airport's terminal area first and incorporate remaining airside and landside components in a second phase.

Figure 1-1: Airport Location Map

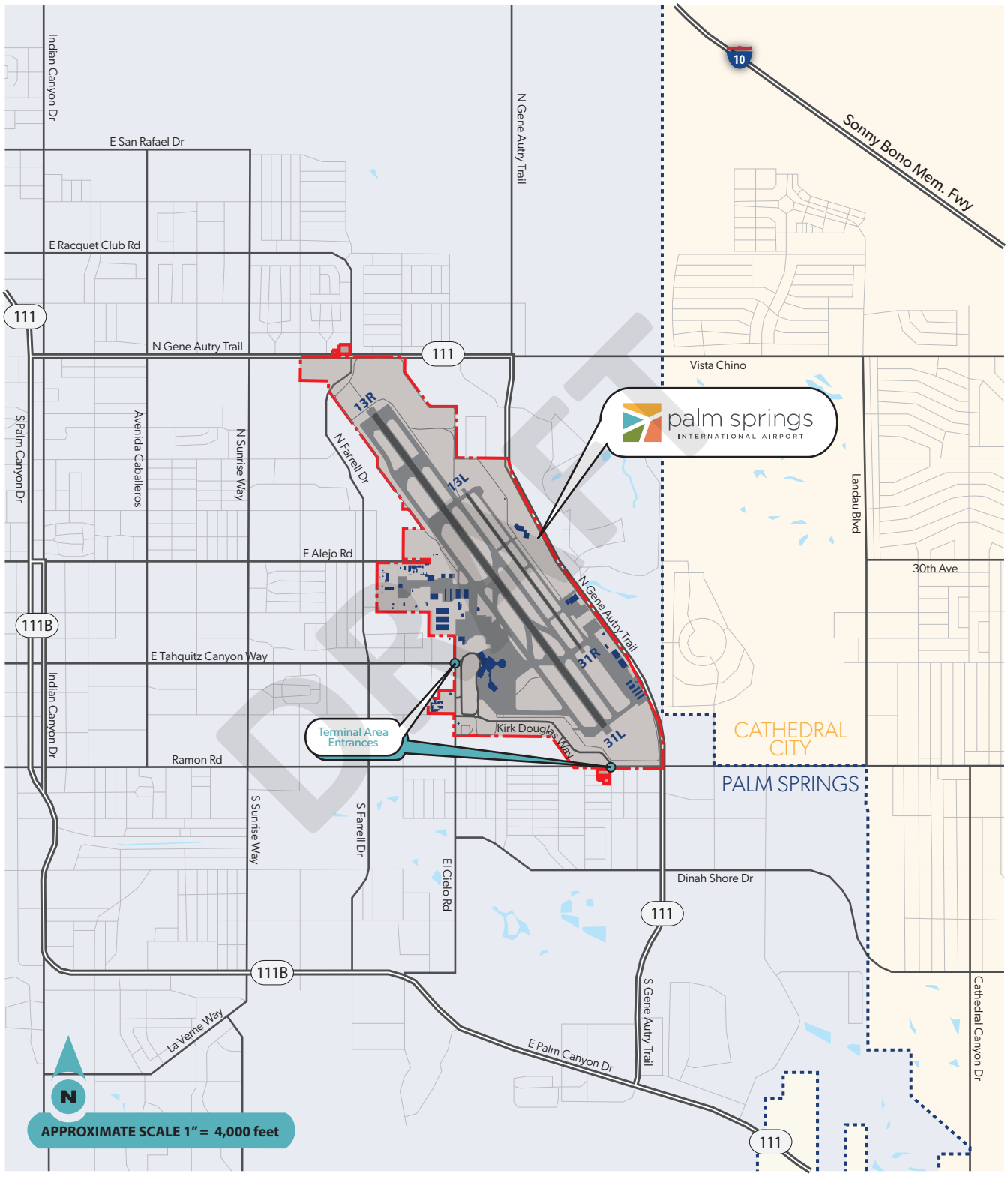


Figure 1-2: Airport Vicinity Map

Airport Ownership and Operation

PSP is owned by the City of Palm Springs. PSP is managed by City of Palm Springs staff under the direction of the City Manager. The Airport Commission serves PSP as an advisory body to City Council and consists of 19 members that are appointed by City Council:

- Ten members reside in and represent the City of Palm Springs.
- Eight members reside in and represent the eight Coachella Valley cities.
- One member represents Riverside County.

Commercial Air Service

Currently, PSP is served by 12 airlines that provide year-round and seasonal nonstop flights to more than 30 destinations as outlined in **Table 1-1**.

Table 1-1: Commercial Service

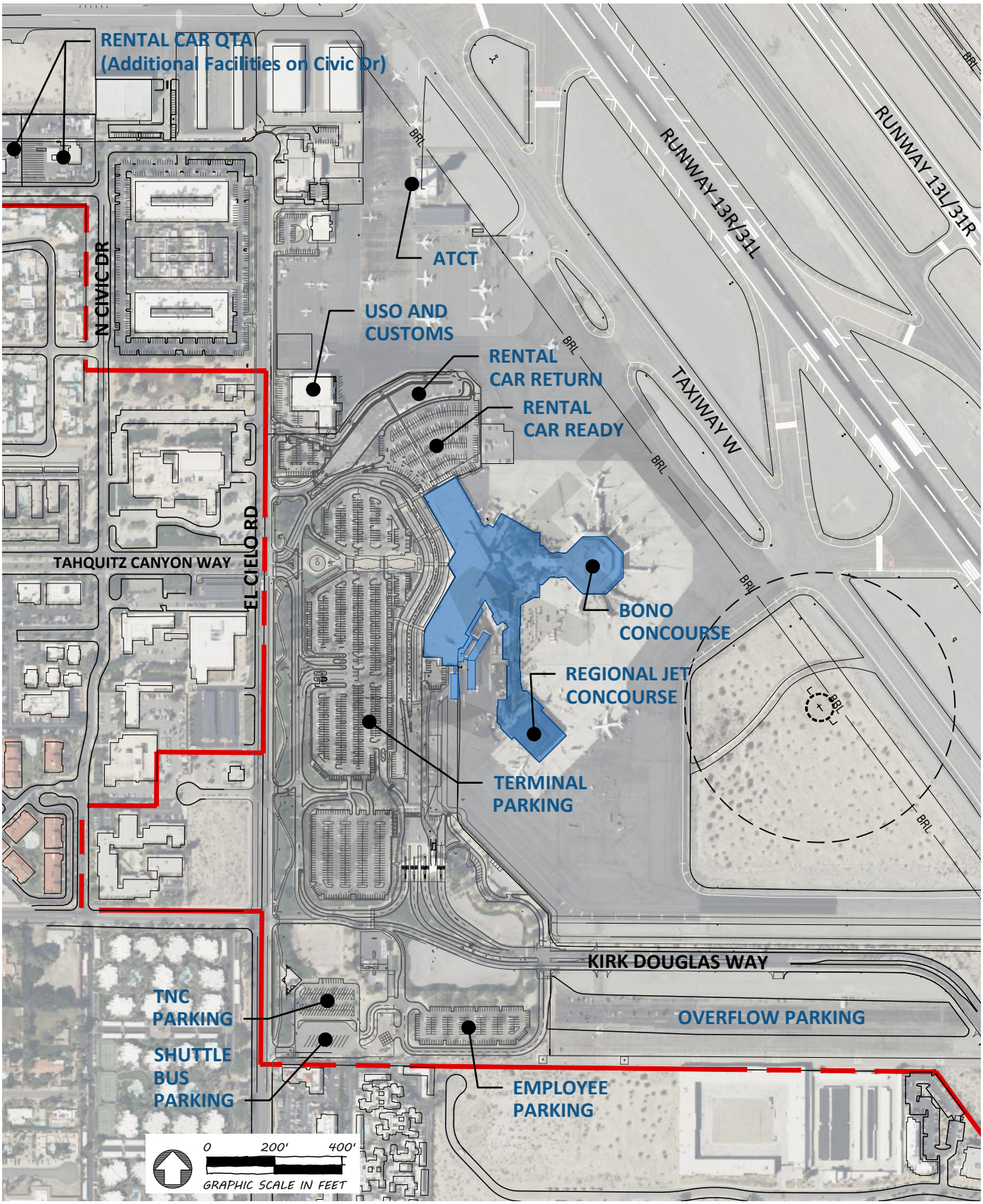
Airline	Nonstop Route	Service Type
Air Canada	Toronto	Seasonal
	Vancouver	Seasonal
Alaska	Boise	Seasonal
	Everette	Seasonal
	Portland	Seasonal
	San Francisco	Year-Round
	San Jose	Year-Round
	Seattle	Year-Round
Allegiant	Bellingham	Year-Round
	Des Moines	Seasonal
American	Austin	Seasonal
	Chicago (ORD)	Seasonal
	Dallas (DFW)	Year-Round
	Phoenix	Year-Round
Avelo	Bend/Redmond	Seasonal
	Eugene	Seasonal
	Santa Rosa	Seasonal
Delta	Atlanta	Seasonal
	Minneapolis	Seasonal
	Salt Lake City	Year-Round
	Seattle	Seasonal
JetBlue	New York (JFK)	Seasonal
Southwest	Dallas Love	Seasonal
	Denver	Year-Round
	Las Vegas	Year-Round
	Oakland	Year-Round
	Phoenix	Year-Round
	Portland	Seasonal
	Sacramento	Year-Round
	San Jose	Year-Round
Sun Country	Minneapolis	Seasonal
United	Chicago (ORD)	Seasonal
	Denver	Year-Round
	Houston	Seasonal
	Los Angeles	Seasonal
	San Francisco	Year-Round
WestJet	Calgary	Year-Round
	Edmonton	Seasonal
	Vancouver	Year-Round
	Winnipeg	Seasonal
Flair	Edmonton	Seasonal
	Toronto	Seasonal
	Vancouver	Seasonal

Source: *PSP Website.*

TERMINAL AREA FACILITIES

Facilities information was gathered from base files, as well as on-site observations, interviews, and a review of historical airport records. The following sections in this chapter provide information on terminal area facilities and functionality. A general depiction of terminal area facilities is provided in **Figure 1-3**.

Figure 1-3: Terminal Area Facilities

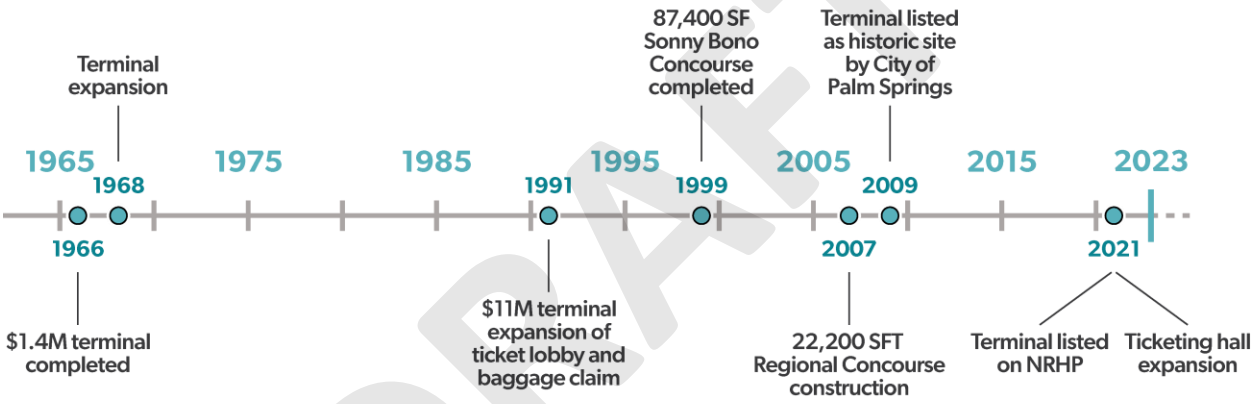


Passenger Terminal Complex Overview

PSP was originally built in 1939 as an emergency landing field for the United States Army Air Corps. In 1941, the land was acquired by the Air Corps Ferrying Command 21st Ferrying Group after the War Department deemed the emergency landing field essential to national defense. The City of Palm Springs purchased the land in 1961 and converted the airfield into Palm Springs Municipal Airport.

The passenger terminal complex has had two significant expansions since it was originally constructed in 1966. The passenger terminal building now consists of roughly 295,000 square feet of space, including 249,000 square feet of ground floor space, and 46,000 square feet of second floor space. In 1999, the 87,632 square feet (SF) Sonny Bono Concourse was constructed; in 2007, the 22,200 SF Regional Jet Concourse was constructed (2,000 SF for a restroom and 20,200 SF of hold room and concession areas). A timeline of terminal construction, expansions, and other notable events is provided in **Figure 1-4**.

Figure 1-4: PSP Terminal Building



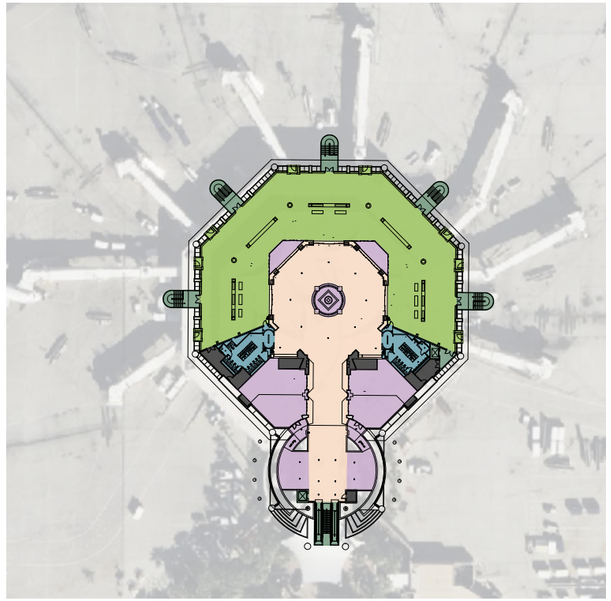
Source: *Mead & Hunt, 2023.*

The terminal is located on the west side of the two runways at PSP. Airline ticketing counters and offices, baggage claim/handling, Transportation Security Administration (TSA) security screening, rental car counters, passenger departure gates, and a self-serve snack bar, are located on the first floor of the terminal. Airport administration offices and public restrooms are located on the second floor of the terminal building. There are several entrances that passengers arriving at PSP can enter the terminal through on the ground level. Passengers can enter through the south terminal doors, located by Sun Country, American, Delta Airlines, as well as, the center of the terminal (direct access to TSA que lines), and the 3 doors located near baggage claims. On the north side of the terminal passengers may enter the baggage claim and car rental counter areas via the entrance from the rental car parking lots. Functional areas within the terminal, Sonny Bono Concourse, and Regional Jet Concourse are depicted in **Figure 1-5**. **Figure 1-6** and **Figure 1-7** provide more focused depictions of the first and second level passenger terminal plans. A detailed evaluation of the passenger terminal building is provided in the **Terminal Building** section of this chapter.

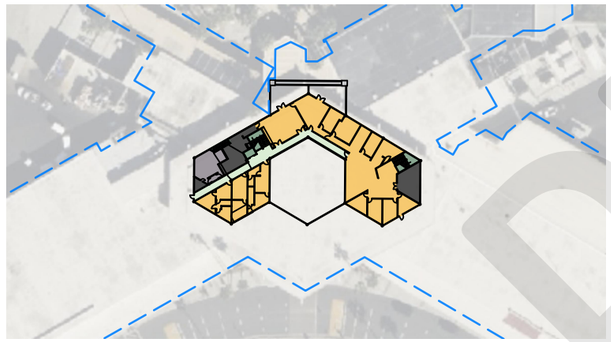
Figure 1-5: Passenger Terminal Complex

Legend

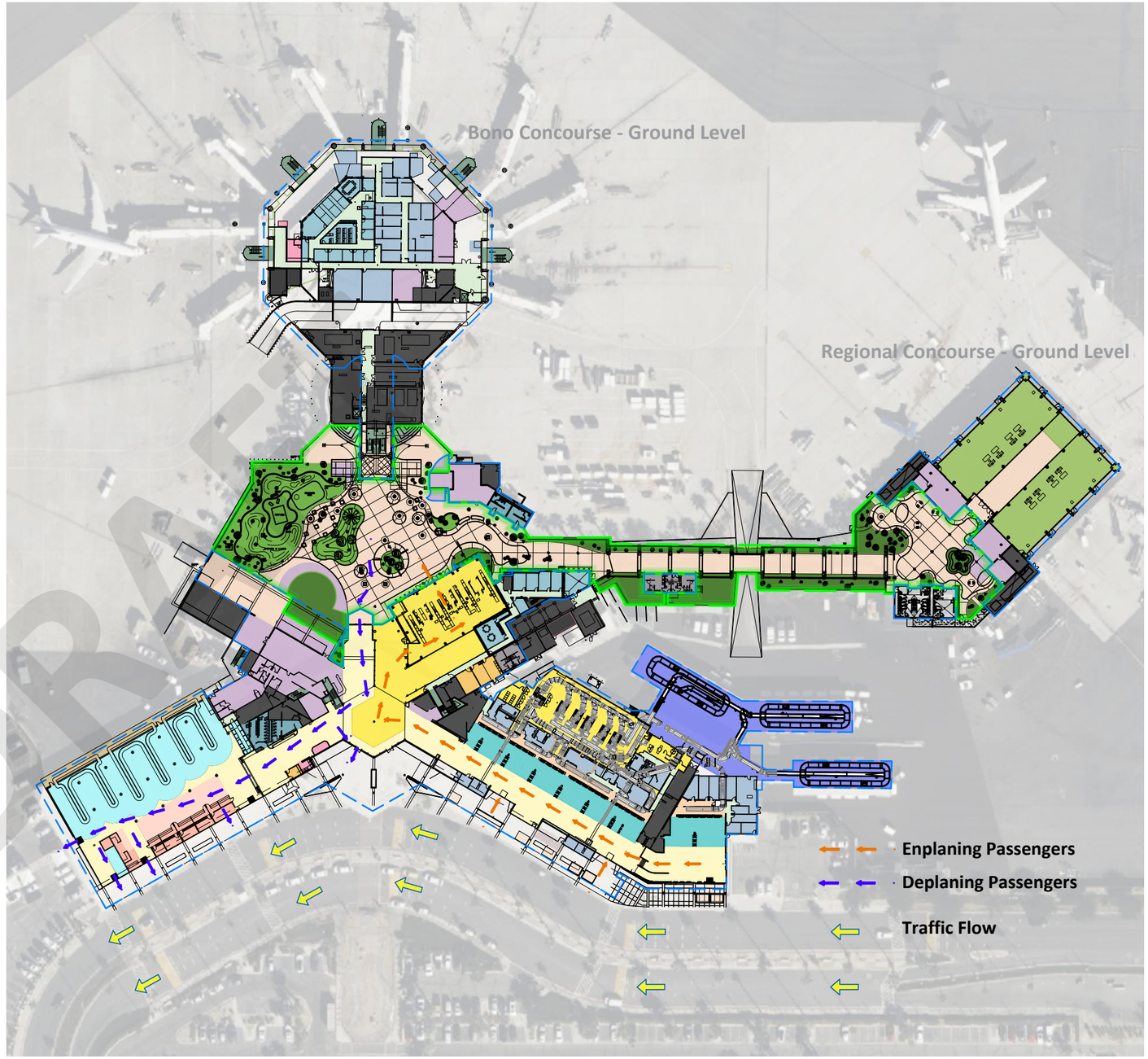
- Airline Operations Offices
- Ticketing Area
- Ticketing Queuing
- Security Screening Checkpoint
- TSA Offices
- Baggage Claim
- Outbound Baggage
- Inbound Baggage
- Baggage Screening
- Public Restrooms
- Non-Public Restrooms
- Rental Car Facilities
- Rental Car Queuing
- Public Circulation
- Non-Public Circulation
- Secure Circulation
- Vertical Circulation
- Airport Administrative
- Outdoor Airport Amenities
- Terminal Landscaping
- Building Systems
- Concessions
- Departure Lounge
- Roof Above
- Outdoor Spaces



Bono Concourse - Second Level



Terminal - Mezzanine Level



Terminal - Ground Level/First Floor

0 60' 120'
GRAPHIC SCALE IN FEET

Figure 1-6: Terminal Floor Plan - First Level

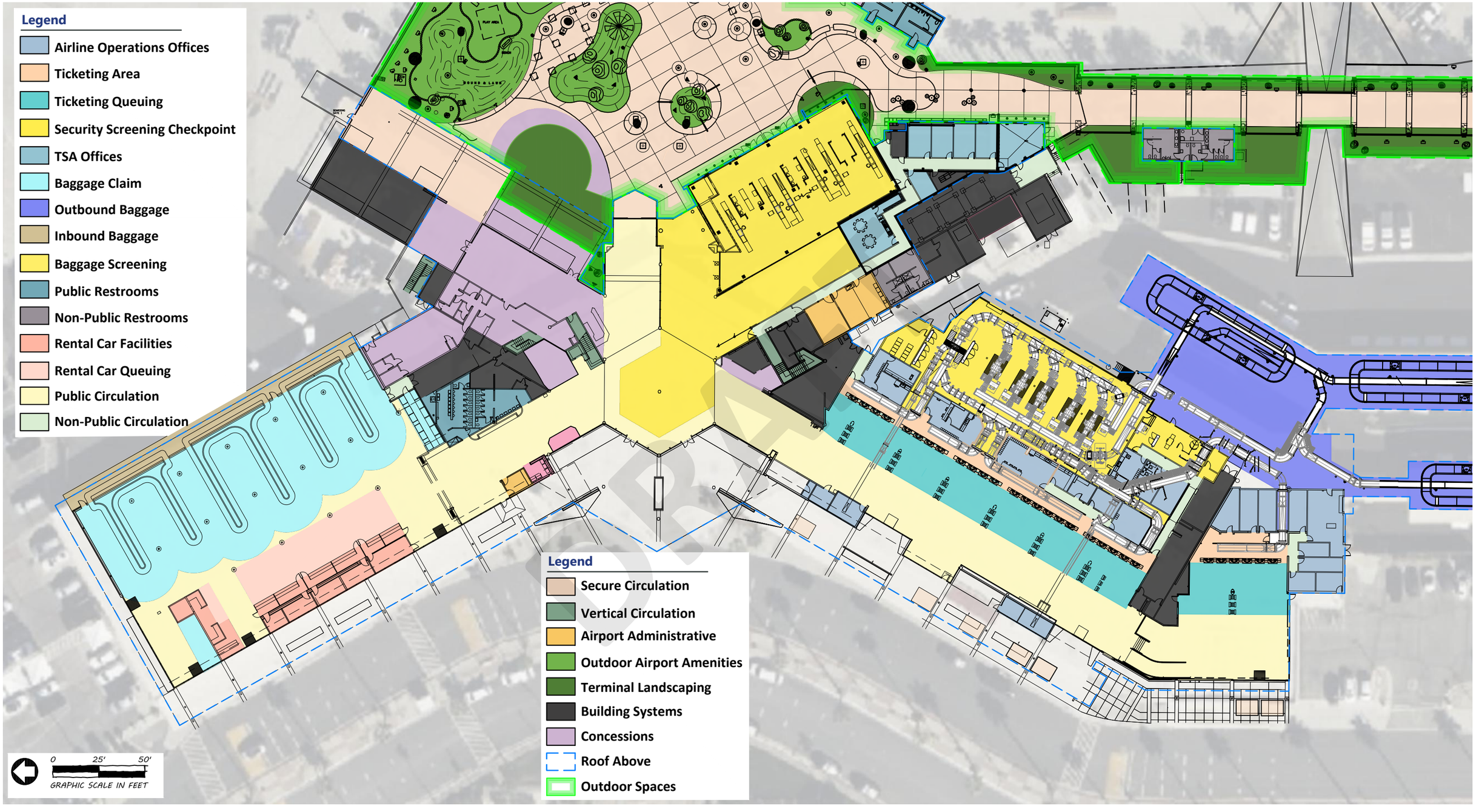
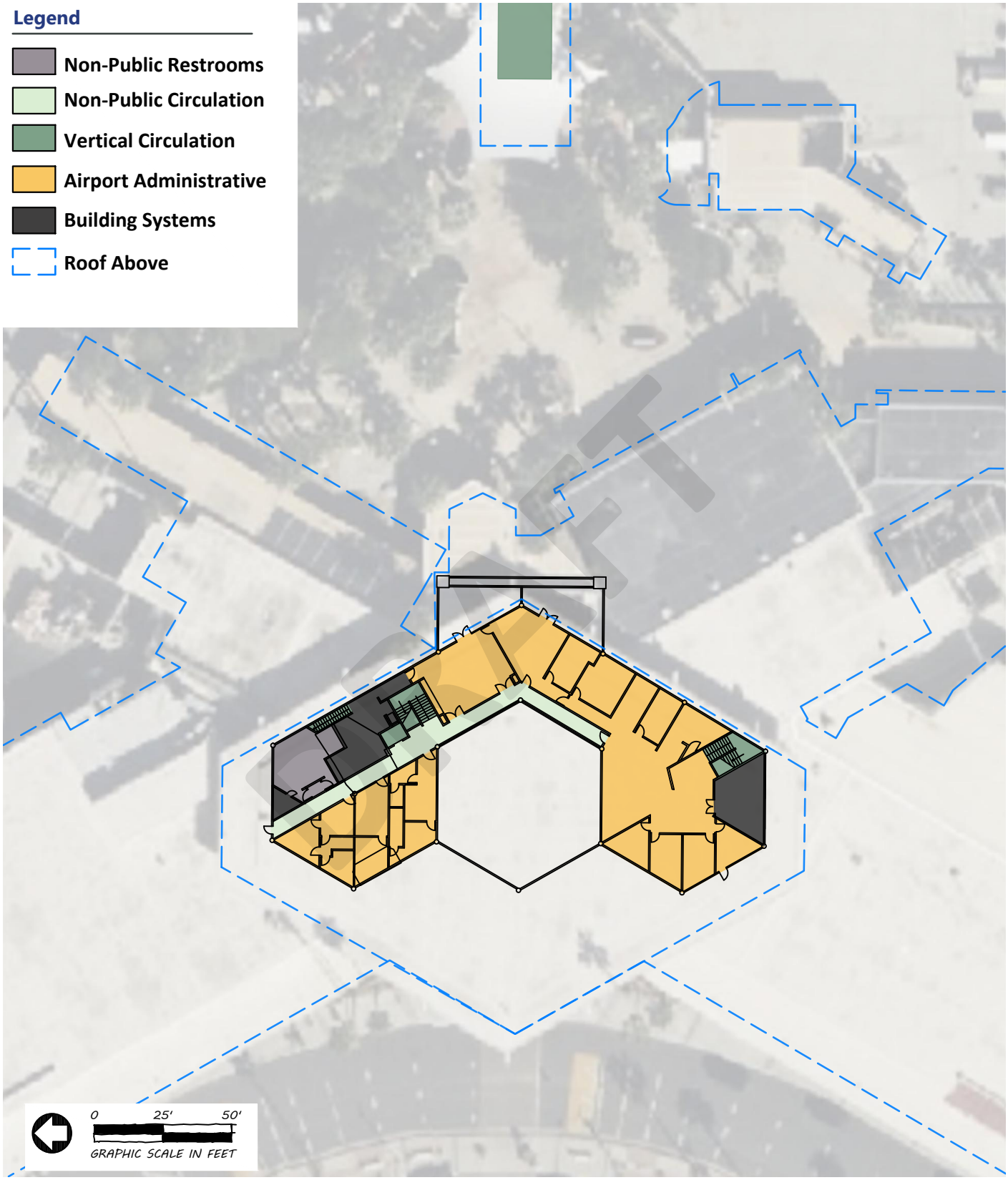


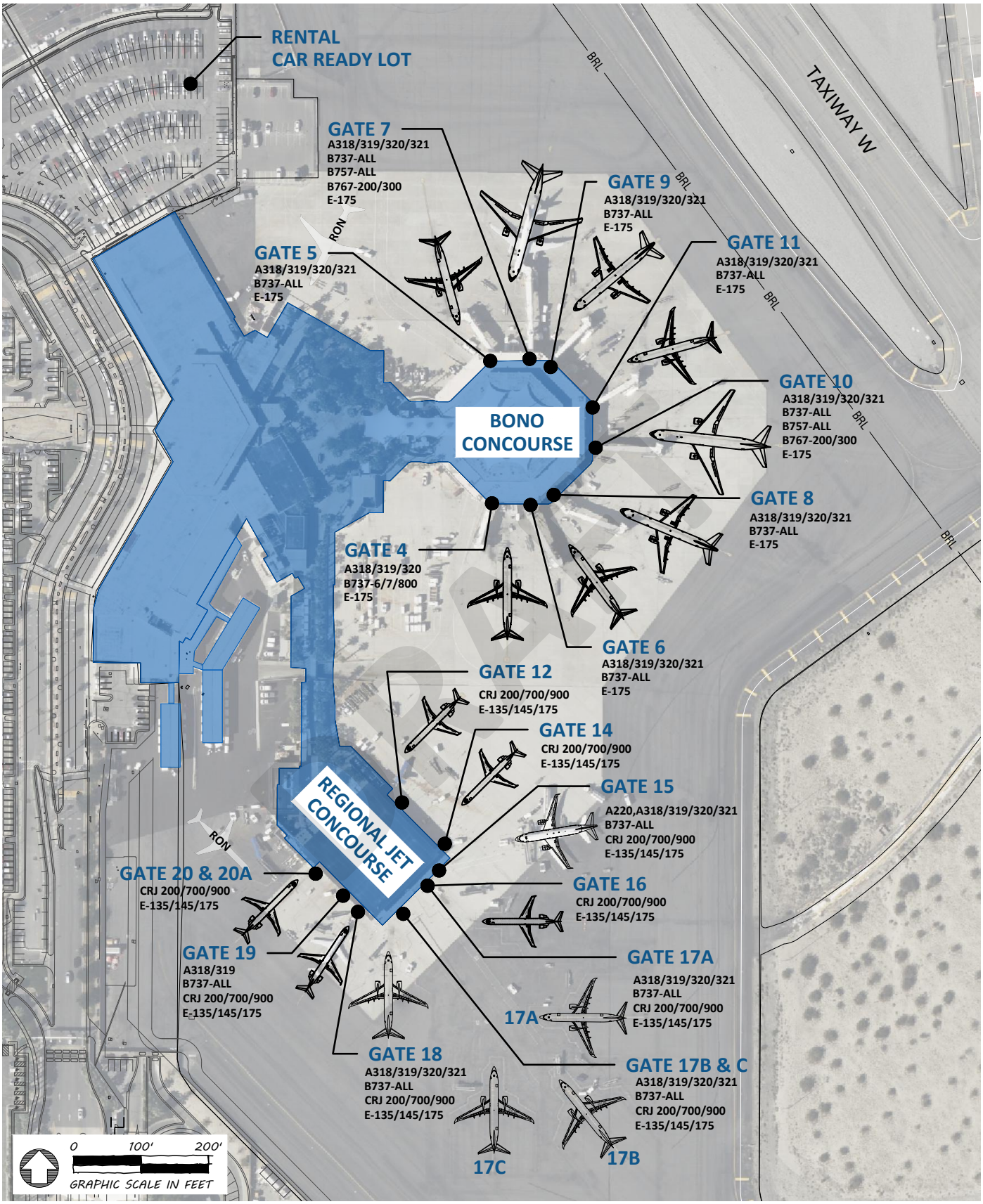
Figure 1-7: Terminal Floor Plan - Mezzanine Level



Terminal – Airside Elements

The commercial aircraft parking apron at PSP is located east of the passenger terminal building and west of Runway 13R/31L. There are currently 11 aircraft parking positions surrounding the Regional Concourse and 9 aircraft parking positions surrounding the Sonny Bono Concourse. Please see **Figure 1-8** for details on aircraft parking positions, gate numbering, and the type of aircraft each gate is capable of supporting.

Figure 1-8: Terminal - Airside



TERMINAL BUILDING

This section describes existing terminal facility conditions. The terminal building was inventoried, and its layout was assessed for overall performance. Physical and operational deficiencies of the existing terminal building and its systems will be identified in subsequent chapters. Additional references for this section include airport meetings, examinations of plans, and a review of previous planning documents. A breakdown of terminal space by functional area is provided in **Table 1-2**. *Please note, the space descriptions and allocations provided below will be updated to reflect proposed concessions changes and other necessary revisions.*

Table 1-2: Terminal Complex Space Breakdown

Space Description	Level 1	Level 2
Ticketing Area		
Ticket Agent Positions (# of)	53	-
Bag-Drop	9	-
Kiosks (# of)	24	-
Ticket Counter Length (ft)	230	-
Ticket Counter Area (sf)	3,294	-
Ticketing Queuing (sf)	5,924	-
Airline Operation Office Space and Storage	13,074	-
Total Ticketing Area	***22,292***	**-**
Baggage Claim Area		
Bag Claim Carousel, Floor Area & Oversize (sf)	11,391	-
Baggage Service Offices (sf)	363	-
Bag Claim Carousel Frontage (lf)	667	-
Bag Claim Carousel (Slope Plate) (# of)	3	-
Outbound Baggage (sf)	14,271	-
Inbound Baggage (sf)	1,920	-
Total Public Baggage Areas	***27,945***	**-**
Airport Support Area		
Administrative (sf)	942	4,810
Storage / Maintenance (sf)	1,401	-
Total Airport Area	***2,343***	***4,810***

Space Description	Level 1	Level 2
Concessions		
Pre-Secure		
Food and Beverage (sf)	666	-
Retail (sf)	-	-
Storage and Support (sf)	5,900	-
SubTotal	***6,566***	**-**
Post-Secure		
Food and Beverage (sf)	3,325	2,000
Retail (sf)	1,091	2,649
Storage and Support (sf)	8,469	-
SubTotal	*12,885*	*4,649*
Total Concessions Area	***19,451***	***4,649***
Departure Lounges		
# of Gates (# of)	10	8
Gate Departure Lounges (sf)	11,959	16,636
Total Departure Lounge Area	***11,959***	***16,636***
Rental Car Area		
Car Rental Ticket Counter Area (sf)	726	-
Rental Car Queuing (sf)	1,869	-
Car Rental Office Area (sf)	854	-
Total Car Rental Area	***3,449***	**-**

Space Description	Level 1	Level 2
General Spaces		
Non-Secure		
Public Circulation (sf)	20,049	-
USO (sf)		1,559
Restroom Area (M+F+Family) (sf)	1,198	523
M+F+Family Restroom fixtures (# of)	15+6	-
Subtotal	*21,247*	*2,082*
Secure		
Secure Public Circulation (sf)	44,926	12,813
Outdoor Airport Amenities*	10,326	-
Terminal Landscaping*	13,260	-
Restroom Area (M+F+Family) (sf)	2,600	2,232
M+F+Family Restroom fixtures (# of)	8+10	15+13
Subtotal	*71,112*	*15,045*
Non-Public		
Non-Public Circulation (sf)	7,659	915
Restroom Area (sf)	2,064	-
Subtotal	*9,723*	*915*
Vertical Circulation	3,442	
Total General Area	***105,524***	***18,042***

Space Description	Level 1	Level 2
Transportation Security Administrative (TSA) Areas		
Security Screening Checkpoint (SSCP)		
Lanes (w/PreCheck) (# of)	6	-
Checkpoint (sf)	6,172	-
Checkpoint Queue (sf)	6,362	-
TSA Admin Offices and Support Space (sf)	6,025	-
Subtotal	*18,565*	-
Baggage Screening Areas		
EDS Devices (# of)	5	-
TSA Bag Screening Floor Area (sf)	8,896	-
Subtotal	*8,896*	-
Total TSA Area	*27,461*	-
Building Support		
Building Systems and Major Chases	22,272	2,161
Total Bldg Support Space	*22,272*	*2,161*
TOTAL TERMINAL FACILITY AREA	**242,696**	**46,298**

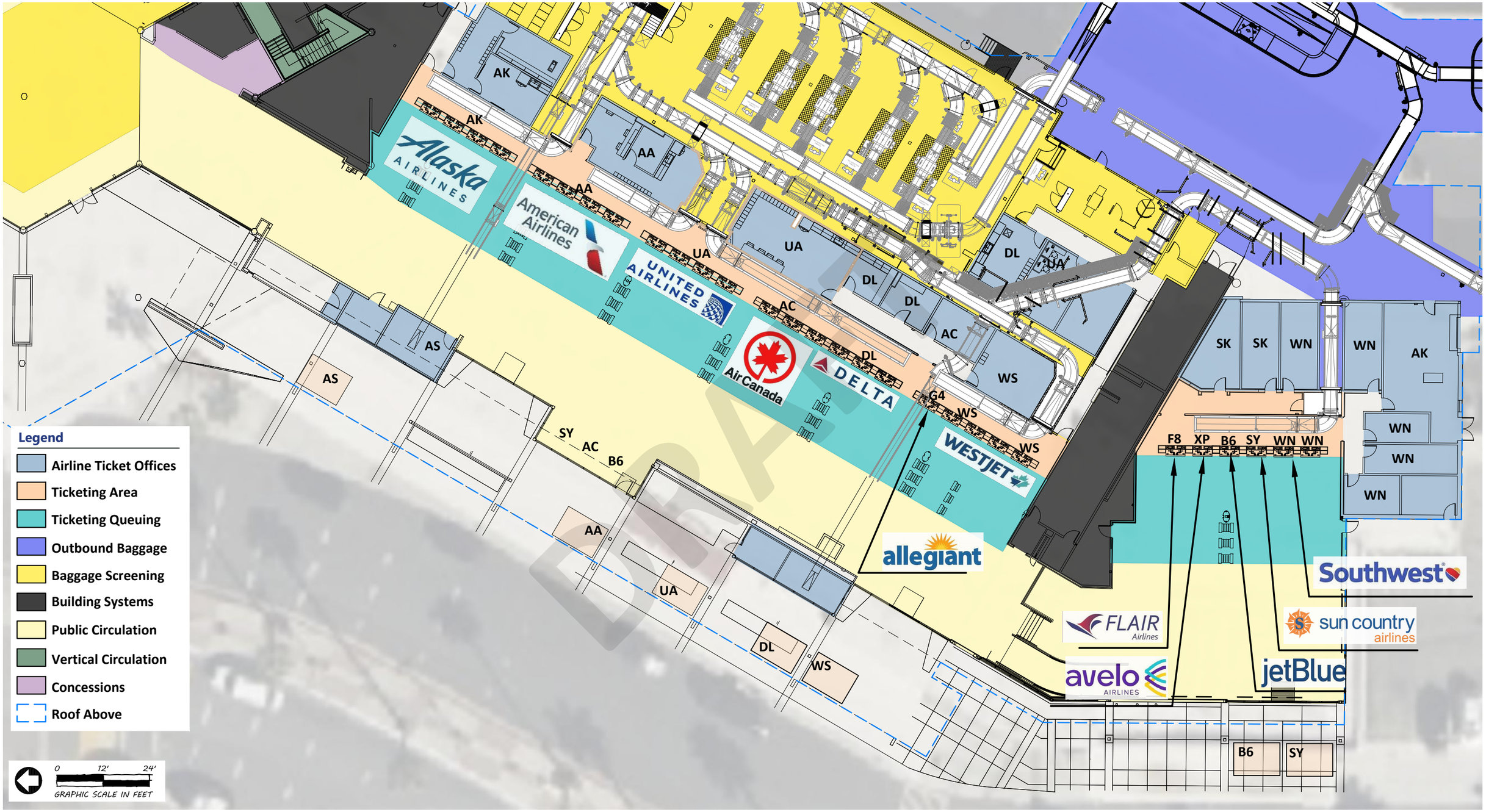
Source: *Mead & Hunt, 2023.*

Ticketing Area and Airline Ticket Offices

The ticketing area is on the south portion of the terminal and consists of ticket counters, kiosks, bag-drop stations, curbside check-in counters, passenger queueing, circulation, and the airline ticket counters. Twelve airlines occupy 46 total full-service ticket counter positions (FSP) in the ticket lobby of the terminal building, depicted **Figure 1-9**. In 2021, the main terminal Ticketing Area was modernized and renovated with the following improvements:

- Ticketing Hall expansion and renovation
- Shared use systems for ticket counter airline check-in process
- Baggage screening consolidation & expansion
- Baggage make-up carousel

Figure 1-9: Airline Ticketing and Offices



Additionally, there are two common-use FSPs and five open FSPs available for future airlines. The airlines listed below in **Table 1-3** occupy the following space:

Table 1-3: PSP Ticketing

Airline	Counter Positions	Self-Check-In Kiosks	Bag Drop Positions	Curbside Check-In Counters
Air Canada	6	0	0	0
Alaska	6	5	1	2
Allegiant	3	0	0	0
American	6	3	2	2
Avelo	1	0	0	0
Delta	6	3	0	1
Flair	1	0	0	0
JetBlue	2	2	1	0
Southwest	4	2	0	0
Sun Country	2	0	0	1
United	4	4	4	1
WestJet	5	5	2	0

Source: *Mead & Hunt, 2023.*

The processing area which includes the area between the front of the counters to the wall separating the airline ticket offices and ticketing area provides 5 feet of depth. The passenger processing area, the area where passengers stand at the counters is approximately 10 feet deep, with space reserved for queuing providing approximately 20 feet of depth. Some airlines that use kiosks have their kiosks mixed in with the queuing area. Beyond queuing is passenger circulation, which consists of a 20-foot-deep corridor which facilitates the movement of passengers and bags between the ticketing area and security screening checkpoint.

Airline ticket offices (ATO's) are located behind the ticketing area and consist of operations space, IT closets, and breakrooms for airline employees.

Outbound Baggage Screening and Make-Up Area

Behind the ATOs is the baggage handling system (BHS), which was recently reconstructed in 2021. See **Figure 1-5** and **Figure 1-6** for location of the BHS. The 8,896 SF BHS expansion consists of four CT-80DR+XL explosive detection system (EDS) scanners and one CT-80DR+L canner with sufficient space to another EDS scanner. With the existing five scanners, baggage throughput is approximately 820-920 bags per hour. A sixth CT-80 machine is anticipated to be installed in late May 2023. Baggage travels to the baggage screening room through seven conveyor lanes—five from the check-in area and two from sub-grade conveyors from the curbside counters. Once baggage reaches the EDS machines, it is manually placed into the machine. Once screened, another person manually places the bag on the conveyor, which then moves the bag to the outbound baggage make-up area.

The outbound baggage make-up area was recently reconstructed with the baggage handling system in 2021 and consists of three, slope-faced, oval carousels. Around each carousel is a staging lane for 16 carts to park parallel to the carousel along with a 10-foot bypass lane. The carousels and staging lanes are covered, while the bypass lanes are not.

Passenger Security Screening

The security screening checkpoint (SSCP) is in the middle of the terminal between the ticketing counter and the baggage claim area as shown in **Figure 1-10**Error! Reference source not found.. The SSCP is comprised of passenger queuing, travel document checkers, six screening lanes, and a recomposure area. TSA PreCheck® and CLEAR are available to passengers. The approximate 6,400 SF queuing area has expanded into the center atrium to accommodate the significant surge of departing traffic during peak times. After queuing, passengers are screened through Leidos AIT and AIT2 scanners. The exiting six-lane configuration has an approximate throughput capacity of 990 passengers per hour. Once passengers are screened, they enter the recomposure area which is directly outside of the security screening checkpoint.

Departure Lounges

There are currently 16 departure gates at PSP. The Sonny Bono Concourse has 8 contact gates, labeled 4 through 11. Gate 1 at the Sonny Bono Concourse is primarily used as a RON apron, but can be utilized as a boarding gate. The Regional Concourse has 8 ground-boarded gates, labeled 12 and 14 through 20, serving 10 aircraft parking positions. The departure lounges in the Sonny Bono Concourse include a 25-foot depth seating area, customer service desks for airlines, and 20-foot depth space for standing around the entirety of the concourse. All passengers walk to their appointed concourse from the outdoor terminal areas and board the departing aircraft via a passenger boarding bridge at the Sonny Bono Concourse or ground-board at the Regional Concourse. **Figure 1-11** details the Regional Jet Concourse and **Figure 1-12** details the Sonny Bono Concourse.

Figure 1-10: Security Screening Checkpoint

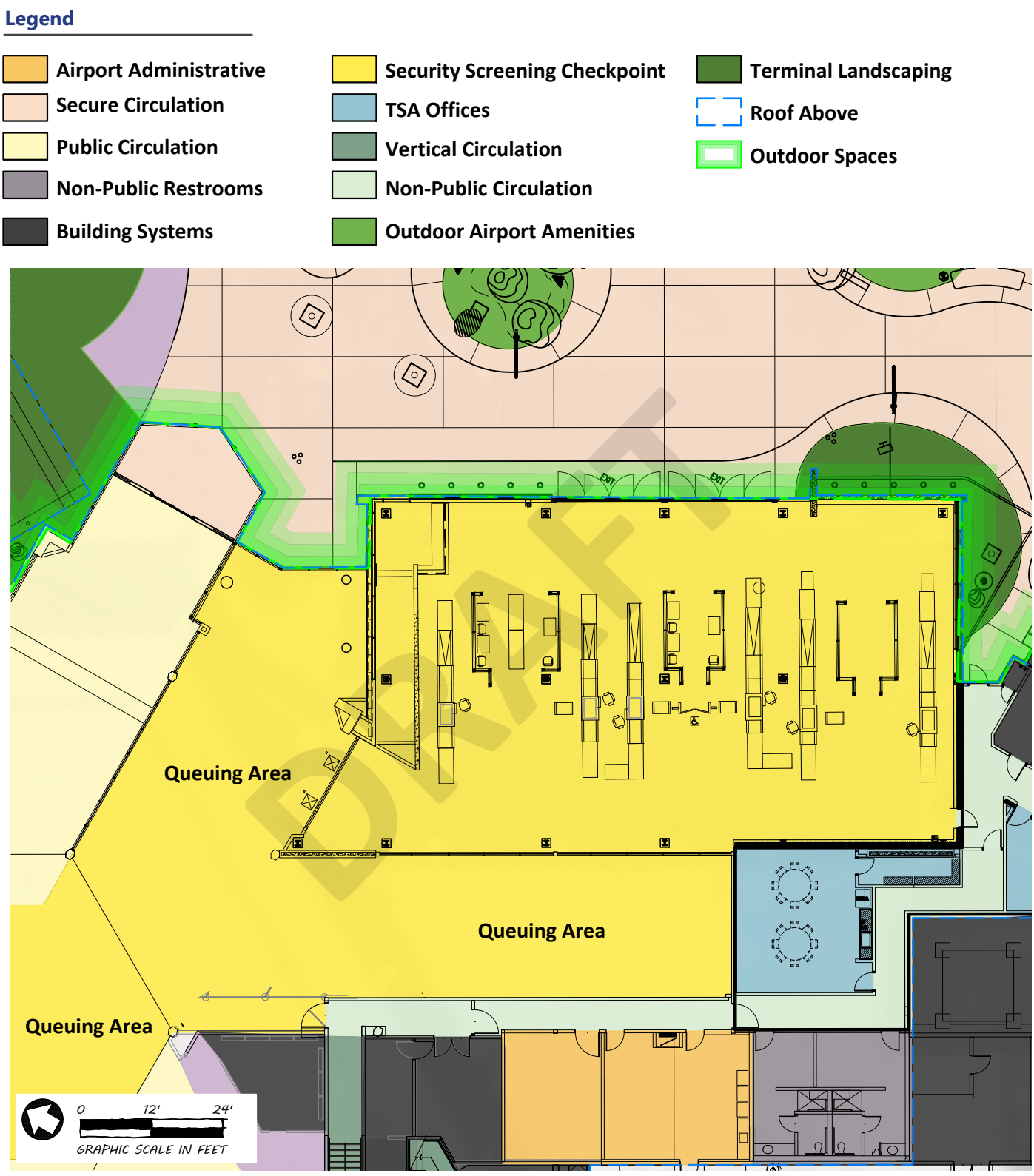


Figure 1-11: Regional Jet Concourse

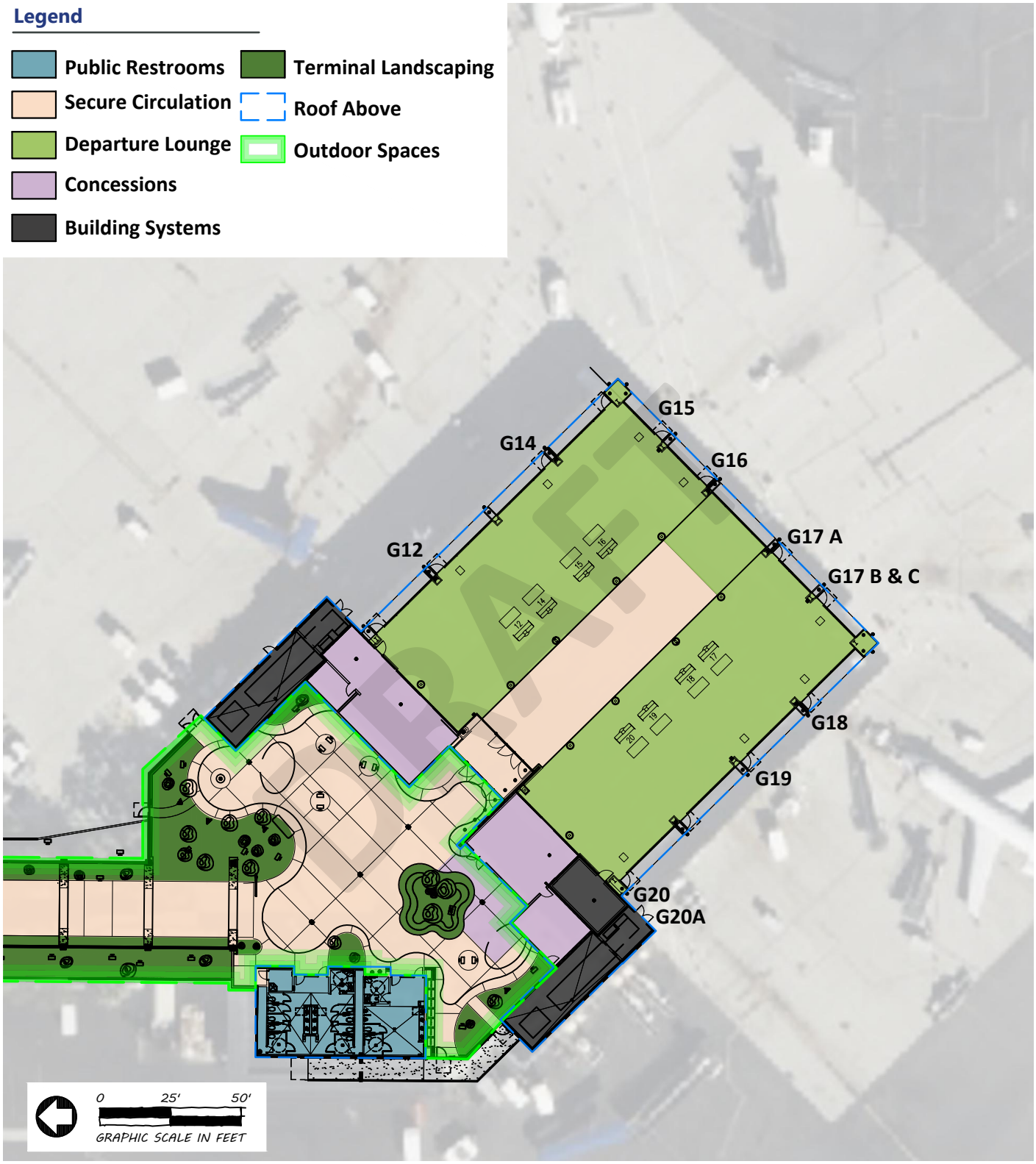
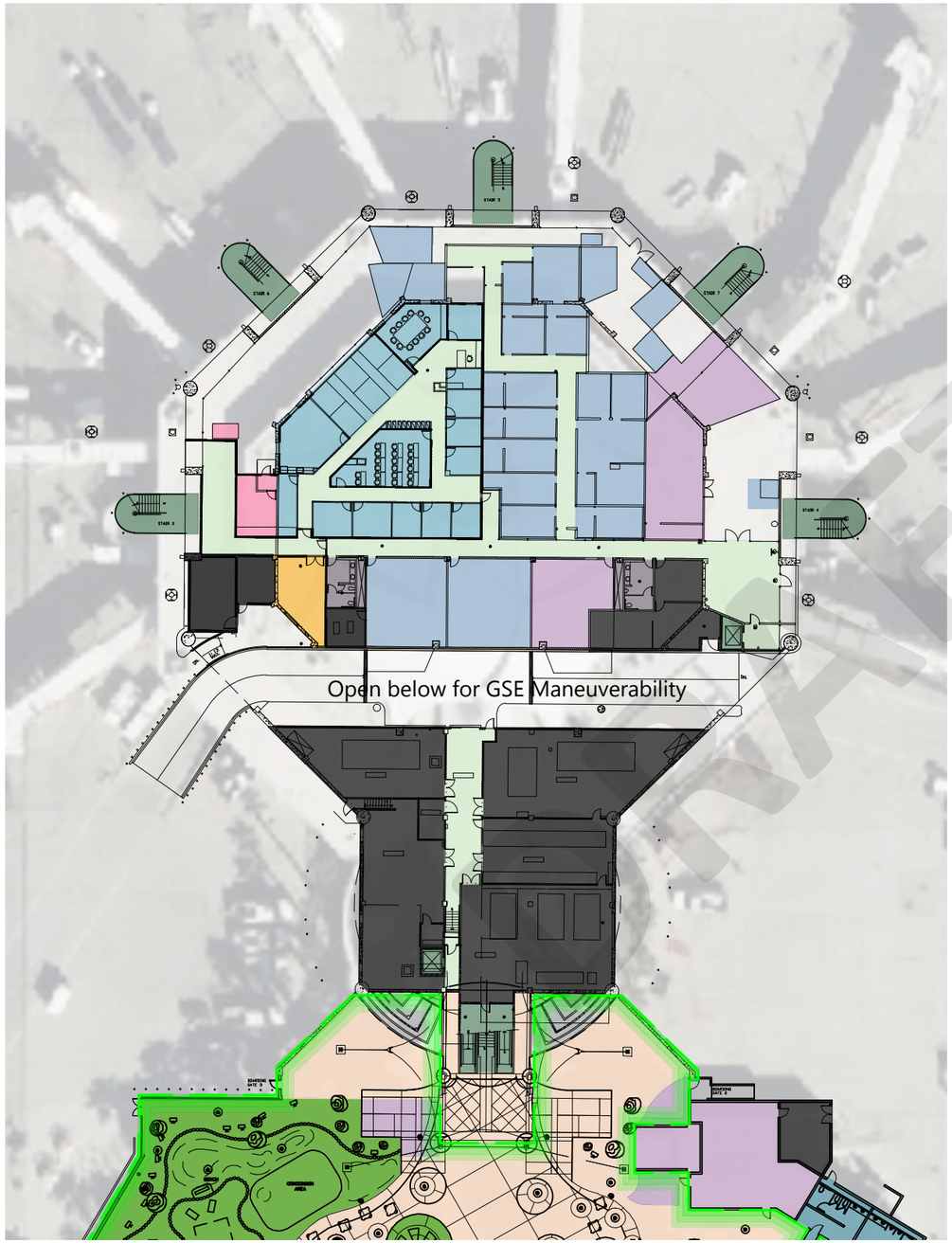


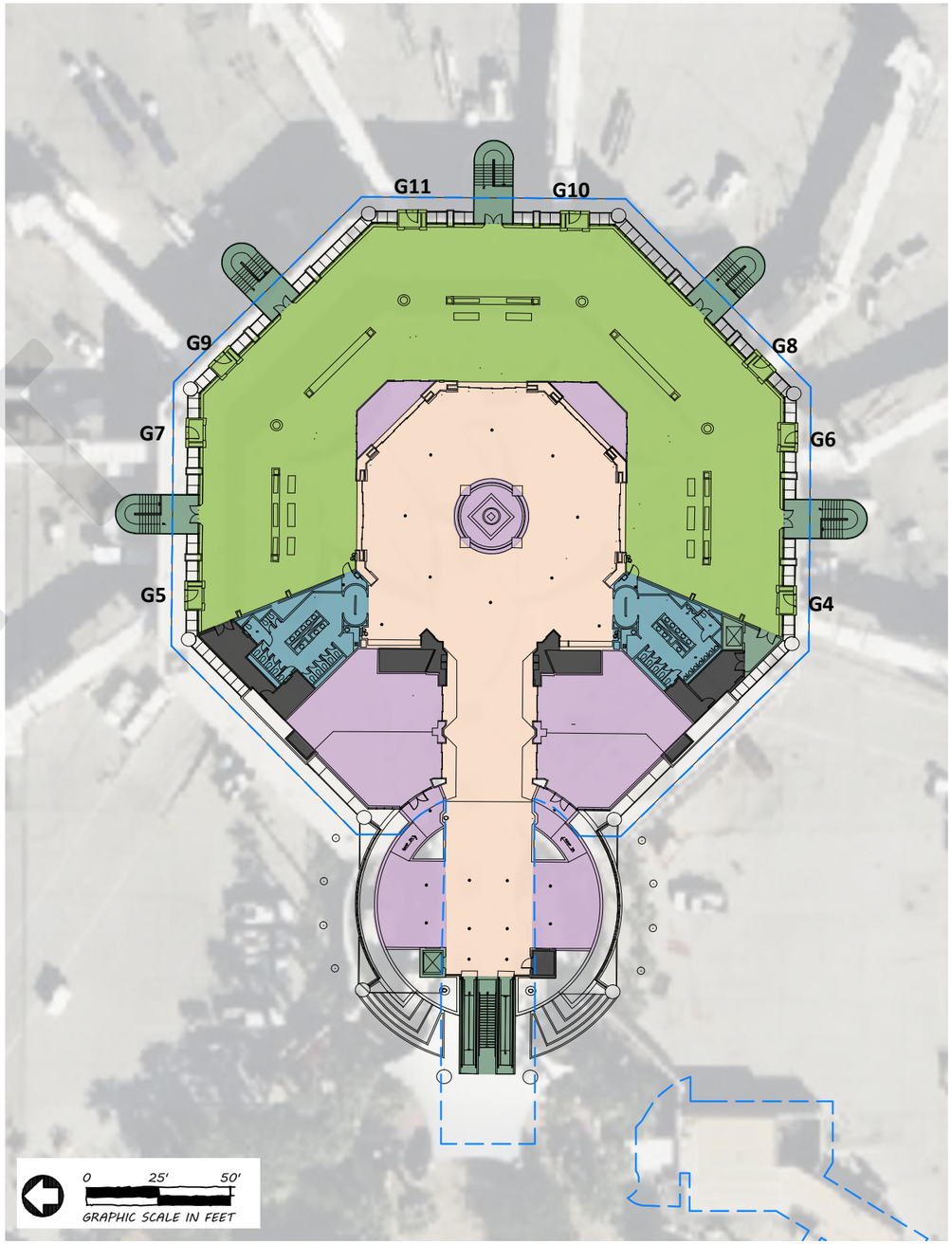
Figure 1-12: Sonny Bono Concourse

Legend

- Public Restrooms
- Non-Public Restrooms
- Non-Public Circulation
- Secure Circulation
- Vertical Circulation
- Departure Lounge
- Concessions
- Airport Administrative
- Outdoor Airport Amenities
- Building Systems
- TSA Offices
- Airline Operations Offices
- Roof Above
- Outdoor Spaces



First Floor



Second Floor

Inbound Baggage Make-Up Area and Baggage Claim

The inbound baggage make-up area is located on the north side of the terminal on the secure side of the wall from baggage claim. The make-up area is located outside and consists of a staging lane for carts to stage parallel to one of the three carousels.

The baggage claim area consists of three "U" shaped, flat-plated carousels. Baggage carousel #1 has a linear frontage of 206-feet, baggage carousel #2 has a linear frontage of 242-feet, while baggage carousel #3 has a linear frontage of 218-feet. South of the baggage claim are four baggage service counters which are shared amongst the airlines.

Rental Cars

10 rental car companies operating at PSP (eight on-site and two located off-airport): Alamo, Avis, Budget, Dollar, Enterprise, Hertz, National, and Thrifty are located at PSP, whereas Desert Rent-A-Car and Go Rentals are located off-Airport. Each of the eight on-site rental car companies have desk space, accompanying office space, and 20-feet of queuing space depth leading to the counters. The counters are visible to passengers when they first enter through the baggage claim area. There is a rental car parking lot conveniently located adjacent to the baggage claim areas at the north side of the terminal. There are 332 "ready" parking spaces and six rental car "return" lanes capable of accommodating approximately 150 vehicles.

Restrooms

There are five sets of public restroom modules in the terminal building which are listed in **Table 1-4**.

Table 1-4: Public Restroom Locations

Location	Men's Fixtures	Women's Fixtures	Other
Pre-Security			
Main Terminal (Level 1)	15	6	Janitor Closet
Main Terminal (Mezzanine)	To be verified	To be verified	
Post-Security			
Adjacent to Regional Concourse	5	10	Janitor Closet
Sonny Bono Concourse	15	13	Janitor Closet
Adjacent to PSP Coffee House	3	3	

Source: *Mead & Hunt, 2023.*

Concessions

The concessions program at PSP consists of pre-secure concessions and post-secure concessions. Changes in concession space use are anticipated to occur in late 2023 and 2024. PSP currently has seven percent of their concessions program pre-security and 93 percent of the program post-secure. On the pre-secure side there is a self-service concessions area called Snack n Go between the exit lane and baggage claim. A Pay On Foot machine is located along the west side of the terminal building, which is where those who utilized public parking can pay their parking ticket. Several gift and specialty item shops are located on the secure side—four in the Sonny Bono Concourse: Desert News, The PGA Tour Shop, Desert Marketplace, and Desert Mart; and one in the Regional Concourse: CNBC. Additionally, there are multiple food and beverage options located on the secure side of the terminal. In the Sonny Bono Concourse is the Santa Rosa Kitchen & Spirits. The Sonny Bono Courtyard accommodates a wine and coffee bar named PSP Coffee House and a food stand called Half Moon Empanadas. In the Regional Concourse, the Buzz by Bar Fly offers food and beverage during the day and a full bar at night.

The primary concessions storage areas are located behind the baggage service offices and the Snack n Go on the first level, and under the Sonny Bono concourse. Concessions deliveries occur through a secure access gate on the southside of the terminal where delivery trucks are screened and then escorted to the terminal.

Airport Amenities

PSP offers an abundance of airport amenities that enhance the passenger experience. Free public Wi-Fi is available, and artwork is on display throughout the terminal. Having the majority of the secure side exposed to the outdoor environment, passengers have many options to experience the outdoors prior to their flight. This includes grassy areas to rest, a kid's playset, pet relief area, outdoor seating, outdoor concessions, and outdoor viewing areas. Additionally, a mother's nursing station is located between the Sonny Bono Concourse and Regional Concourse.

Administrative Area

PSP's primary administrative area is located on the mezzanine level of the terminal and consists of 14 offices and a conference room. Airport staff utilize the office space located within the vehicle inspection plaza. There are additional administrative offices and a breakroom for maintenance staff located on the first floor of the Sonny Bono Concourse. PSP's operations space is located on the first-level adjacent to the security screening checkpoint and outbound baggage make-up area.

TSA's administrative space is split between an area adjacent to the security screening checkpoint and baggage screening rooms and an area on the first level of the Sonny Bono concourse.

TERMINAL ACCESS, PARKING, AND SUPPORT FACILITIES

Vehicle Roadway Access and Circulation

PSP is located approximately 5 miles south of I-10 and accessible by vehicle from all directions via CA-111. Major streets providing access to the terminal building include East Tahquitz Canyon Way, Kirk Douglas Way, El Cielo Road, Ramon Road, and North Farrell Drive.

From East Tahquitz Canyon Way, vehicles enter a two-lane loop where access is provided to public parking. Just before the first turn in the loop, the two lanes divide. The left lane is designated for small (private and commercial) vehicles and the right lane for oversized (charter buses, delivery, and cargo) vehicles as well as other commercial vehicles (taxis, charter shuttles, and limos) that access the taxi and bus staging lot south of the Airport. Both lanes are direct traffic to the terminal curbfront. However, the lane for oversized and commercial vehicles directs traffic towards Kirk Douglas Way, where vehicles make a U-turn back towards the terminal loop road. Oversized vehicles and other commercial vehicles can enter the taxi and bus staging area or make a U-turn turn to the terminal on Kirk Douglas Way located opposite the cargo vehicle exit.

Prior to entering the terminal curbside area, all vehicles are directed through a 6-lane vehicle inspection plaza prior to approaching the terminal curbside. The terminal curbside consists of three inner lanes closest to the terminal that is primarily used for the loading and unloading of private vehicles while the three outer lanes serve commercial vehicles. The vehicle parking and circulation system is shown in **Figure 1-13**.

Vehicle Parking

Public parking facilities at PSP are managed by a parking management firm and include four connected parking lots. While public parking is not separated into short- or long-term lots, there are approximately 900 parking spaces in the main lots west of the terminal and approximately 700 spaces available in an overflow parking lot south of Kirk Douglas Way. Parking rates in the main lots are free for the first seven minutes then $2 for every 20 minutes with a maximum $20 dollar charge per twenty-four hour period. A rate of $18 per day applies to vehicles parking in the overflow parking lot. A cell phone waiting lot located along Kirk Douglas Way provides free temporary parking for vehicles picking up arriving passengers.

Rental car ready/return parking is located immediately north of the baggage claim and rental car areas. There are 332 ready and 150 return spaces for a total of 482 ready/return parking spaces. The 11-acre overflow lot provides space for approximately 700 vehicles; shuttle buses transport passengers from the overflow lot to the terminal. Existing public and employee parking areas are detailed in **Table 1-5** along with approximate parking spaces.

Figure 1-13: Vehicle Parking and Circulation

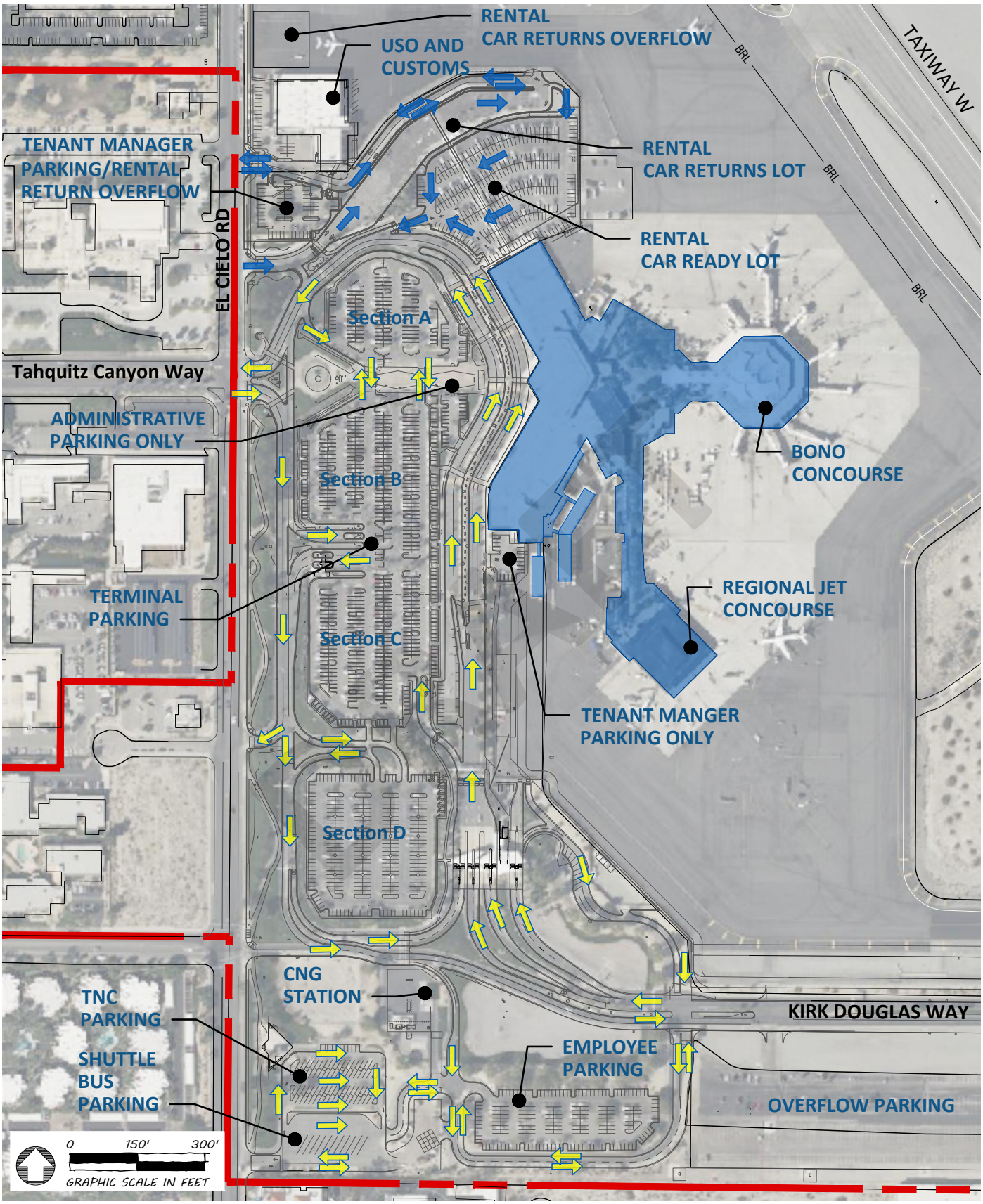


Table 1-5: Parking Areas

Lot	Description/Location (and rate if applicable)	Number of Spaces
Public Parking		
A & B	Main Lot (Maximum $20/day)	377
C & D	Main Lot (Maximum $20/day.	538
Cell Phone	Free	21
Overflow Lot	Maximum $18/day.	≈700
Employee/Terminal Tenant Parking		
Tenant Manager	(Immediately south of the terminal)	16
Tenant Manager	(South of the USO building)	≈50
Airport Administration	(Immediately west of the terminal)	17
Employee Parking	(South along Kirk Douglas Way)	176

Source: *Mead & Hunt, 2023.*

Note: *≈ indicates approximate*

Transit Services

Public Transportation

There are four bus stations within a 15-minute walking distance from the Airport: Ramon at Desert Way, Tahquitz Canyon at Civic, Palm Springs Airport, and Farrell at Tahquitz Canyon. In addition, public transportation is available via:

- **Sun Transit Agency** – offers bus transportation in the Coachella Valley. Two stops are located within three blocks of the airport.
- **Morongo Basin Transportation Authority (MBTA)** – offers transportation to Joshua Tree, Yucca Valley, Twenty-Nine Palms, and the 29 Palms Marine Base. The bus stop is located at the north end of the terminal, in front of the Rental Cars ready lot.
- **Amtrak** – offers a bus-to-train service at the PSP airport to Fullerton and Los Angeles. The bus stop is located at the north end of the terminal, in front of the Rental Cars ready lot.

Shuttle/Private Ground Transportation

Many hotels and resorts offer courtesy shuttles to and from the Airport.

Rental Cars

As mentioned earlier, there are 10 rental car companies available to arriving passengers (8 on-site and 2 located off-airport): Alamo, Avis, Budget, Dollar, Enterprise, Hertz, National, and Thrifty are located at PSP, whereas Desert Rent-A-Car and Go Rentals are located off-Airport. Car sharing service companies, such as Turo, may soon be available for PSP travelers.

TNCs/Taxis

Transportation network companies (TNCs) such as Uber and Lyft, provide pick-ups and drop-offs at the Palm Springs International Airport. Taxi service is provided by the following companies:

- City Cab
- Coachella Valley Taxi
- Yellow Cab of the Desert

Ground Service Equipment

PSP has ground handling providers that store Ground Service Equipment (GSE) on the terminal apron, primarily in between the Sonny Bono Concourse and the Regional Jet Concourse. The space in between the two concourses that is used to store GSE is roughly around 25,000 SF. Each gate is equipped with a jet bridge and in between the jet bridges, additional GSE equipment is stored.

Fueling Services

There are two fixed based operators (FBOs) at PSP, Signature Flight Support, located near the terminal and Atlantic Aviation, located on eastside of Runway 13/31. Signature Flight Support provides fueling services to aircraft parked at the terminal. Both Signature Flight and Atlantic Aviation offer 100LL line service and Jet A line service, along with aircraft parking, maintenance, and additional services.

TERMINAL BUILDING CONSTRUCTION AND BUILDING SYSTEMS

When considering future building expansion at PSP, the building code implications of additional expansion of the terminal building need to be considered. To facilitate an expansion, an analysis of the existing building will need to be undertaken to understand the full impact to allowable area expansion of the buildings. Elements that would need study include building type, seismic risk category, fire protection systems, uses within the building, and adjacencies to higher/lower risk uses.

ENVIRONMENTAL REVIEW

Understanding the environment on and surrounding PSP allows for efficient planning of future development and aids in compliance with federal and state regulations. Awareness of the surrounding environment also affords the opportunity to understand how PSP affects the environment and neighboring community. This environmental inventory section is not intended to satisfy environmental clearance requirements outlined in FAA Order 1050.1F, Environmental Impacts and Procedures, nor is it intended to fulfill requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). It does provide a baseline condition of environmental resources that are known to occur on or near the terminal area. The intent is to provide an understanding of the potential for environmental impacts associated with airport development alternatives and to consider avoidance and minimization of potential impacts throughout the terminal area planning process.

Air Quality

Air quality analysis for federally funded projects must be prepared in accordance with applicable air quality statutes and regulations, including the Clean Air Act of 1970, the 1977 Clean Air Act Amendments, the 1990 Clean Air Act Amendments, and the National Ambient Air Quality Standards (NAAQS). The air pollutants of concern in the assessment of impacts from airport related sources include six "criteria pollutants"; carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM-10 and PM-2.5), and sulfur dioxide (SO2). Regions are designated as "attainment," "nonattainment," and "maintenance" by the EPA based on the status relative to the NAAQS. Attainment refers to geographic areas that meet the NAAQS, while nonattainment refers to areas that do not meet the NAAQS. Maintenance areas refer to geographic areas that were once nonattainment but have recently achieved compliance with NAAQS.

Short-term air quality impacts may be expected from heavy equipment pollutant emissions, fugitive dust (small mineral particles from soil) resulting from the movement of earth for cut and fill, any open burning that may occur on the Airport, and the operation of concrete batch plants. Contractors would be required to comply with all local, state, and federal air quality regulations, especially the procedures contained in the Federal Aviation Administration's Advisory Circular (AC) 150/5370-10A, Standards for Specifying Construction of Airports, which is the FAA guidance to airport sponsors concerning protection of the environment during terminal area construction projects.

Ambient air quality is measured and collected at monitoring stations geographically located within the various air basins throughout Southern California. The City of Palm Springs is generally impacted by air contaminants within the geographical boundaries of the South Coast Air Basin (SoCAB), which comprises all of Orange County and the non-desert portions of the counties of San Bernardino, Riverside, and Los Angeles and the Riverside County portion of the Salton Sea Air Basin (SSAB).

The City of Palm Springs is in the nonattainment area for ozone and particulate matter levels exceed federal and/or state established ambient air quality standards. Ozone is primarily produced from vehicular activity. For the Airport, the level of ozone emitted may be reduced by encouraging the use of mass transit, walking, shuttle services, and other alternative-fuel vehicles. The City is also in a nonattainment status for particulate matter due to its sitting in the Coachella Valley Association of Governments (CVAG) "Blows and Hazard Zone".

Farmland

The Farmland Protection Policy Act (FPPA) regulates federal actions that may impact or convert farmland to a non-agricultural use. FPPA defines farmland as "prime or unique land as determined by the participating state or unit of local government and considered to be of statewide or local importance". Per the Natural Resources Conservation Service (NRCS) Web Soil Survey, the Airport is located in an area designated as "Not Prime Farmland".

Floodplains

Executive Order 11988, Floodplain Management requires federal agencies to "avoid to the extent possible the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative".

The Flood Insurance Rate Map (FIRM) is an official map of a community on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs) and the risk premium zones applicable to the community. An examination of the FIRM for PSP shows that the Airport and surrounding area are located approximately one mile west of the Whitewater River, the primary drainage channel which flows through the Coachella Valley watershed to the Salton Sea. A 100-year floodplain extends onto airport property along the Gene Autry Trail. The FBO Atlantic Aviation is located within the floodplain.

Hazardous Material, Pollution Prevention, and Solid Waste

Federal actions that pertain to the funding or approval of airport projects require the analysis of the potential for environmental impacts per the regulating laws. Furthermore, property listed or considered for the National Priority List (NPL) should be evaluated in relation to the Airport's location. There are no known hazardous waste sites on airport property.

Construction activities can generate hazardous wastes and some construction materials constitute hazardous substances. These include fuel, oil, lubricants, paints, solvents, concrete-curing compounds, fertilizers, herbicides, and pesticides. Proper practices should be implemented to prevent or minimize the potential for these hazardous substances to be released into the environment. Chemicals, petroleum-based products, and waste materials, including solid and liquid waste, should be stored in areas specifically designed to prevent discharge into storm water runoff. Areas used for storage of toxic materials should be designed with full enclosure in mind, such as the establishment of a dike around the perimeter of the storage area. Construction equipment maintenance should be performed in a designated area and control measures, such as drip pans to contain petroleum products, should be implemented. Spills should be cleaned up immediately and disposed of properly.

Historic, Architectural, Archeological, and Cultural Resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources associated with human activities, society, and cultural institutions. Federal law requires project sponsors who require federal funds or approvals to consider how their proposed projects would affect historic properties. In accordance with NEPA and Section 106 of the National Historic Preservation Act (NHPA), the FAA is the lead agency for identifying the potential impacts of a proposed project on these resources and consulting with the federally recognized tribes, the State Historic Preservation Office (SHPO), and other agencies, as necessary.

According to the National Park Service's National Register of Historic Places (NRHP), the Palm Springs Municipal Terminal is listed as a NRHP property. There are three NRHP listed properties in the vicinity of the Airport: Palm Springs City Hall (0.3 miles west), Palm Springs Desert Museum (0.1 east), Palm Springs Tramway Valley Station (9.0 miles west), and Palm Springs Unified School District Educational Administrative Center (0.2 miles east).

Character defining elements of the entire terminal building include the interior elements of the lobby, original natural rock walls, and landscape features that are confined within the central core and four wings of the building. There is a site the contains two-diamond shaped lawns, four tree islands, a fountain, and original parking areas. These elements contribute to retaining the historical integrity and significance of the terminal at PSP by meeting the criteria in Sections A and C of the National Register.

Threatened and Endangered Species

The Endangered Species Act, as Amended, requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. According to the U.S. Department of the Interior Fish and Wildlife Service (USFWS), Information for Planning and Consultation (IPaC) website, there are several threatened and endangered species that may occur in proximity to the Airport; however, due to the active nature of the terminal area, lack of standing water, and proximity to active aircraft, it is unlikely that these species exist in the terminal area. The Peninsular Bighorn Sheep (Ovis Canadensis Nelsoni) – Endangered, Least Bell's Vireo (Vireo Bellii Pusillus) – Endangered, and Southwestern Willow Flycatcher (Empidonax Traillii Extimus) – Endangered are animal species that have the potential to be found in the airport vicinity. The Coachella Valley Fringe-toed Lizard (Uma Inornata) – Threatened, Desert Tortoise (Gopherus Agassizii) – Threatened, and Mountain Yellow-legged Frong (Rana Muscosa) – Endangered are the potential reptiles and amphibians that could be found within the airport vicinity. The Monarch Butterfly (*Danaus plexippus* – Candidate) is an insect that has potential to occur in the terminal area. There are no critical habitats in the terminal area. In general, the PSP property does not provide suitable habitat for any potential threatened or endangered species.

Section 4(f) Property

According to Section 4(f) of the Department of Transportation Act (recodified as 49 USC, Subtitle I, Section 303), no publicly owned park, recreation area, wildlife or waterfowl refuge, or land of historic site that is of national, state, or local significance shall be used, acquired, or affected by programs or projects requiring federal assistance for implementation unless there is no feasible or prudent alternative. The closest 4(f) properties include numerous parks and NRHP listed properties in the City of Palm Springs.

Water Quality

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Water quality considerations related to airport development often include increased surface runoff and erosion, and pollution from fuel, oil, solvents, and deicing fluids.

Due to the desert environment in Palm Springs, managing water demand is essential. Groundwater demand today exceeds the amount of water that is recharged from surface run-off from the surrounding mountains and inflow from the Whitewater River. However, through a contract with the Metropolitan Water District of Southern California (MWD), additional water is obtained from the Colorado River. Water demand strategies to consider may include recycling stormwater.

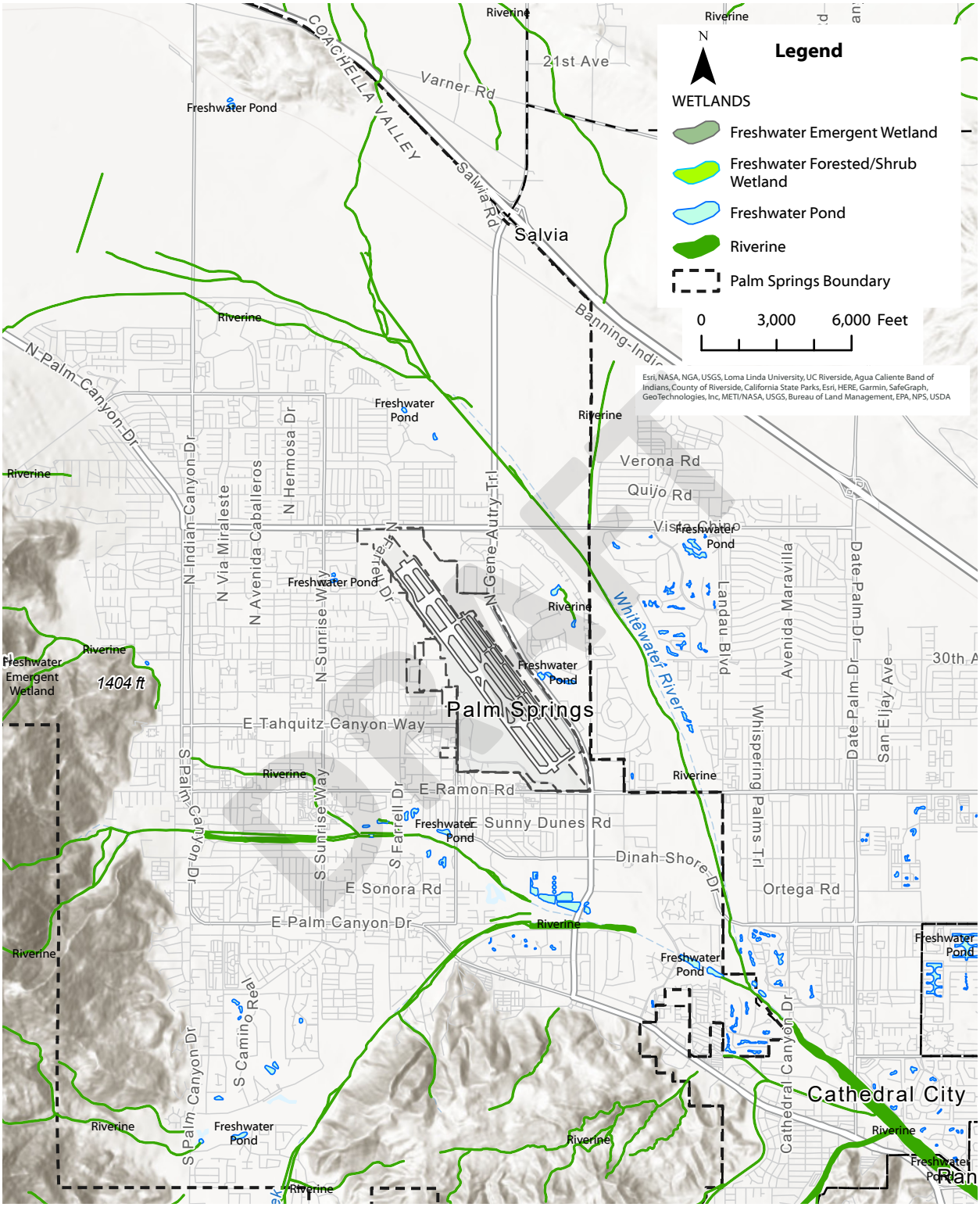
Stormwater runoff generally flows to the southeast, toward the intersection of Gene Autry Trail and Ramon Road before flowing east to the Whitewater River via a storm drain. Although storms are infrequent at Palm Springs, when the top water in the vicinity of the Airport is disturbed, surface water drainage is likely to cause erosion to unprotected areas, impacting surface water quality.

Wetlands

The Clean Water Act (CWA) defines wetlands as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands are typically found in swamps, marshes, bogs, and similar areas. Federal regulations require that proposed actions avoid, to the greatest extent possible, long-term and short-term impacts to wetlands, including the destruction and altering of the functions and values of wetlands.

According to the National Wetlands Inventory (NWI) maps maintained by the U.S. Fish and Wildlife Service, there are no wetlands depicted on airport property, as illustrated in **Figure 1-14**.

Figure 1-14: Wetlands



SUMMARY

The goal of this chapter is to provide background information pertaining to the terminal area and terminal building at PSP. Information presented in this chapter will be referenced in later chapters. The next steps in the airport master planning process are assessing the aviation activity and demands expected to be placed on the facility over the 20-year planning period and evaluating the ability of existing facilities to accommodate this demand.

Chapter 2 – Aviation Activity Forecast

OVERVIEW

Growth in aviation activity drives airport development needs and plans. This chapter provides forecasts of unconstrained demand for aviation services at Palm Springs International Airport (PSP or the Airport) for 20 years from 2023 through 2042, on a calendar year basis unless stated otherwise. This chapter focuses primarily on commercial passenger traffic and airline operations, as they place the greatest demand on facilities at the Airport, particularly on the terminal and related facilities. The forecasts encompass commercial passenger enplanements, aircraft operations, and corresponding peak period activity profiles, to guide planning for the future development of the terminal and other facilities at the Airport. In addition, the chapter provides forecasts of belly cargo, as well as noncommercial general aviation and military aircraft operations to cover all aviation activities at the Airport.

Forecast development is a comprehensive process that involves understanding the regional and macroeconomic context, the historical trends in aviation activity at the Airport, and how regional and macroeconomic factors shape aviation activity trends at the Airport. **Appendix A** provides a detailed assessment of relevant demographic and economic indicators at the regional and national levels, while **Appendix B** identifies sources of forecast risk and uncertainty. This chapter begins with an analysis of historical commercial passenger traffic trends at the Airport, which informs forecast development and provides context for the resulting forecasts of commercial passenger aviation activity.

Forecast development involves using various quantitative methods and data sources to analyze different types and measures of aviation activity, also explained in this chapter. Although quantitative methods provide a systematic and replicable framework for developing quantitative forecasts, every step involves qualitative assessment and professional judgment, drawing insights from the analyses of the Airport's

regional and macroeconomic environment, trends in aviation activity at the Airport, and trends in the aviation industry.

HISTORICAL COMMERCIAL AVIATION ACTIVITY

In this section, we examine past commercial aviation activity at PSP, which mainly involves scheduled passenger carriers. There are no all-cargo carriers at the Airport. However, scheduled passenger carriers transport some belly cargo. We analyze historical data available through 2022 and present annual data on calendar year basis unless stated otherwise.

Operating Airline History

According to airline schedules accessed as of March 6, 2023, there are 12 passenger carriers with scheduled service at PSP through 2023. Since 2018, PSP has lost two service providers: Frontier Airlines in 2021 and Virgin America in 2018 (Alaska Airlines acquired Virgin America). Additionally, five other airlines—mostly smaller and low-cost—have come and gone, each lasting one to two years at the Airport. These five airlines include Boutique (2020-2021), Contour (2019-2020), Corporate Flight Management (2019), ExpressJet (2022), and Swoop (2021-2022). Two airlines entered the PSP market during the COVID-19 pandemic and continue to serve the Airport: Southwest in 2020 and Avelo in 2022. Southwest's entry was likely due to the airline's opportunistic strategy during the COVID-19 pandemic to spread out its services to mitigate the negative impact of the pandemic.

Several major airlines, including Alaska, American, Delta, Southwest, United, and WestJet, operate year-round flights at the Airport. However, Air Canada, Flair, Sun Country, Allegiant, and JetBlue do not operate during the summer season. In 2022, Air Canada and Flair did not operate from May to September, Allegiant and JetBlue did not operate from June to September, and Sun Country did not operate from June to August.[1] All five airlines mentioned above resumed flights toward the end of the year. Error! Reference s ource not found. shows the passenger carriers that provide scheduled service at PSP.

[1] OAG Schedules Analyzer, last accessed April 14, 2023.

Table 2-1: Carriers with Scheduled Service at PSP, by Calendar Year

Carriers With Scheduled Service at PSP						
Airlines	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Air Canada	•	•	•	•	•	•
Alaska Airlines	•	•	•	•	•	•
Allegiant Air LLC	•	•	•	•	•	•
American Airlines	•	•	•	•	•	•
Avelo Airlines					•	•
Delta Air Lines	•	•	•	•	•	•
Flair Airlines	•	•		•	•	•
JetBlue Airways	•	•	•	•	•	•
Southwest Airlines			•	•	•	•
Sun Country Airlines	•	•	•	•	•	•
United Airlines	•	•	•	•	•	•
Westjet	•	•	•	•	•	•
Former PSP Service Providers						
Boutique Air			•	•		
Contour Airlines		•	•			
Corporate Flight Management		•				
ExpressJet Airlines, Inc.					•	
Frontier Airlines Inc.	•	•	•	•		
Swoop				•	•	
Virgin America	•					

Source: *OAG Schedules Analyzer, last accessed on March 6, 2023.*

HISTORICAL ENPLANEMENT TRENDS

Fundamentally passenger traffic is driven by changes in the U.S. economic cycle—the demand for air travel grows during periods of economic expansion and declines during periods of economic recession. Passenger traffic is also affected by significant changes in airline network strategies and one-off events such as the 2001 terrorist attacks, which took place during the 2001 U.S. economic recession, and the ongoing COVID-19 pandemic, which caused the 2020 economic recession. Smaller airports tend to be vulnerable to changes in airline service.

Significant Developments Affecting the U.S. Airline Industry

The U.S. aviation industry enjoyed several periods of rapid expansion, including the 1980s following the federal deregulation of the industry and the 1990s during a decade-long economic boom. Nevertheless, the long-running U.S. economic expansion ended abruptly with the bursting of the dot-com bubble in 2001. Since then, additional adverse events have prompted significant structural changes that continue to shape the industry today.

The terrorist attacks on September 11, 2001, caused a significant decrease in air travel demand for several months. U.S. airlines, especially American Airlines and United Airlines, suffered significant financial losses. Airport security measures were strengthened to prevent future attacks, resulting in longer passenger screening times. This discouraged air travel especially for short-haul destinations that could be reached by ground transportation. To attract passengers, airlines lowered airfares, and both leisure and business travelers became increasingly price sensitive. The internet also made it easier to search and compare airfares.

Meanwhile, airlines faced rising fuel costs. Jet fuel prices quadrupled from 2000 to 2008, remaining at record-high levels through 2014. Amid record fuel prices, the U.S. economy entered the Great Recession from December 2007 to June 2009—the most drawn-out U.S. economic recession since the Great Depression. The recession spread globally and weakened air travel demand. Because of the significant and negative labor market impacts of the recession, including large declines in household income, the ensuing economic and air travel recovery was slow.

Mounting financial difficulties resulting from high fuel costs and weak demand during the Great Recession led to airline bankruptcies and mergers, leaving four major airlines—American, Delta, Southwest, and United—controlling 80 percent of the U.S. domestic passenger traffic. Surviving airlines responded with various cost-cutting measures. They retired old aircraft, acquired larger and more fuel-efficient aircraft, and added seats to existing aircraft. They transferred routes between mainline and regional service to match the supply of seats with demand better. They changed their route networks to maximize profits, moving flights from less to more profitable markets. To increase profitability, they not only changed pricing structures to increase revenue, but they also made deliberate cuts to flight schedules to increase load factors and improve aircraft utilization—a business strategy that has become known as the U.S. airline industry capacity rationalization, and said cuts fell disproportionately on small and medium hub airports.

Although the U.S. economic recovery from the Great Recession was slow, it spurred the longest U.S. economic expansion on record. As air travel demand returned, the U.S. airline industry began earning profits in 2010 and sustained those profits for more than ten years. In late 2014, jet fuel prices began to fall, allowing airlines to boost profits, renew fleets, and increase flight schedules while maintaining capacity discipline. As the economy continued to expand, nationwide air traffic growth accelerated in the last quarter of the decade, despite adverse shocks to the industry, including the grounding of the Boeing 737 MAX, a recent addition to the commercial passenger aircraft fleet.

In 2020, COVID-19 infections emerged, and the spread of the virus was declared a global pandemic on March 11, 2020. As a result, air travel came to a near halt, and U.S. airport passenger traffic plummeted nearly 97 percent in mid-April 2020. The pandemic significant impacted air travel, inducing structural changes in both the demand for air travel and the supply of airline passenger service that may have long-lasting effects on the airline industry.

Unlike the experience following previous shocks, the recovery of business travel from the pandemic has been slower than the recovery of leisure travel for holidays, vacations, and visiting friends and relatives. Factors delaying business travel recovery include:

- The widespread adoption of virtual conferencing.
- The delay in the workers' return to offices.
- The possible permanent transition to remote work and hybrid work practices.

International travel was suspended for an extended period and continued to be depressed by travel restrictions that remained in place to varying degrees in certain countries. Slow recovery in business and international travel slowed passenger traffic recovery at most airports.

In response to the sharp decrease in air travel demand at the onset of the pandemic, airlines reduced capacity by retiring older aircraft models and postponing the delivery of new ones. They also shrank their workforce by creating voluntary retirement and extended leave incentives. Then, as air travel demand rebounded, airlines began restoring flights. However, as recovery progressed, the constraint shifted to the supply side: fleet constraints, delays in new aircraft deliveries, and labor shortages limited airlines' capacity to meet returning demand.

Unlike the aftermath of the Great Recession, consumers recovered strongly from the deep but brief recession caused by the COVID-induced economic lockdowns and stay-at-home orders. The job market rebounded strongly: Today, unemployment is historically low and job openings outnumber those looking for jobs. Households emerged, on average, with relatively healthy finances and the ability to spend on the pent-up demand for travel. With COVID-19 infections slowing down, international travel has been gradually returning as pandemic-related restrictions get lifted, including China's three-year-long border restrictions and closure to foreign visitors, which has reopened as of March 2023. However, international travel recovery is hampered instead by geopolitical reasons, including the ongoing war between Russia and Ukraine that began in early 2022.

Historical Long-Term Enplanement Trends at PSP

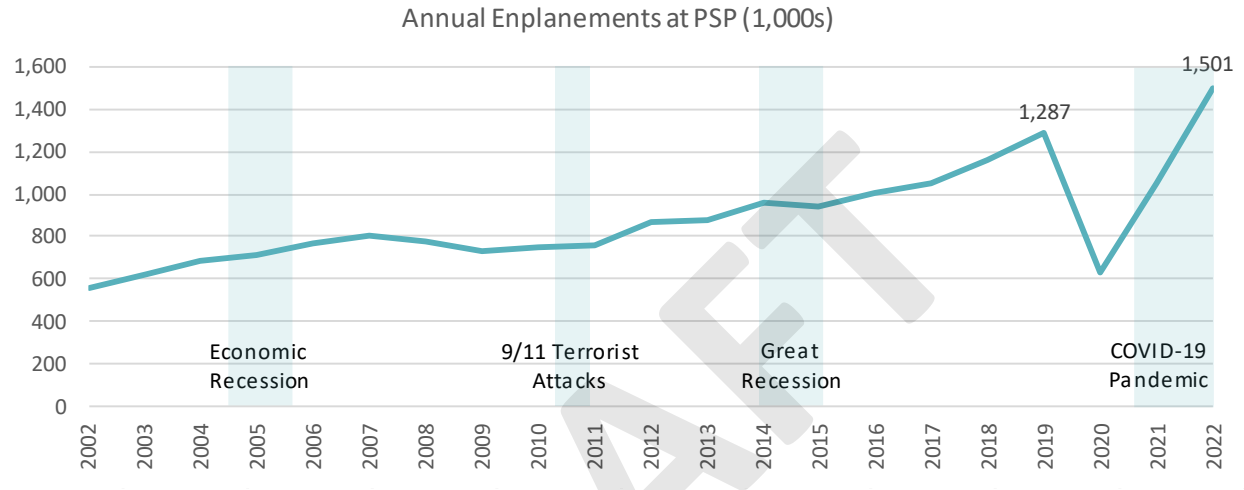
Figure 2-1 shows PSP's long-term enplanement history from 1986 through 2022. Despite experiencing several economic recessions between 1986 and 2022, passenger traffic at PSP exhibited strong growth, growing by a 2.7 percent compound annual growth rate (CAGR). Since 2002, passenger traffic growth has accelerated to a 5.1 percent CAGR from 2002 through 2022. During this period of accelerated growth, PSP experienced one period of significant decline in air traffic: the 2008-2009 Great Recession, which led to a 9.0 percent decrease from 807,706 enplanements in 2007 to 734,908 enplanements in 2009. However, the entries and re-entries of new airlines—Air Canada (in 2015), Frontier (in 2012 and again in 2018), and JetBlue (in 2016)—contributed to a 36.3 percent in air traffic between 2015 and 2019, as air traffic rose from 944,625 enplanements to 1.3 million.

In 2020, the COVID-19 pandemic halted the Airport's upward momentum. As a result of a nationwide suspension of air travel and other lockdown efforts attempting to contain the spread of COVID-19, PSP's

enplanements fell 50.9 percent down to about 632,000 enplanements in 2020. Passenger traffic has not reached such a low level since 2003, and 2020 easily marked the largest single decline in the Airport's history.

However, the next two years brought PSP's fastest recovery, helped along by the widespread distribution of COVID-19 vaccinations. As of 2022, the Airport reached 1.5 million enplanements, surpassing its pre-pandemic 2019 peak of 1.3 million.

Figure 2-1: Annual Enplanements at PSP



Source: *Airport records.*

Comparison With U.S. System Enplanement Trends

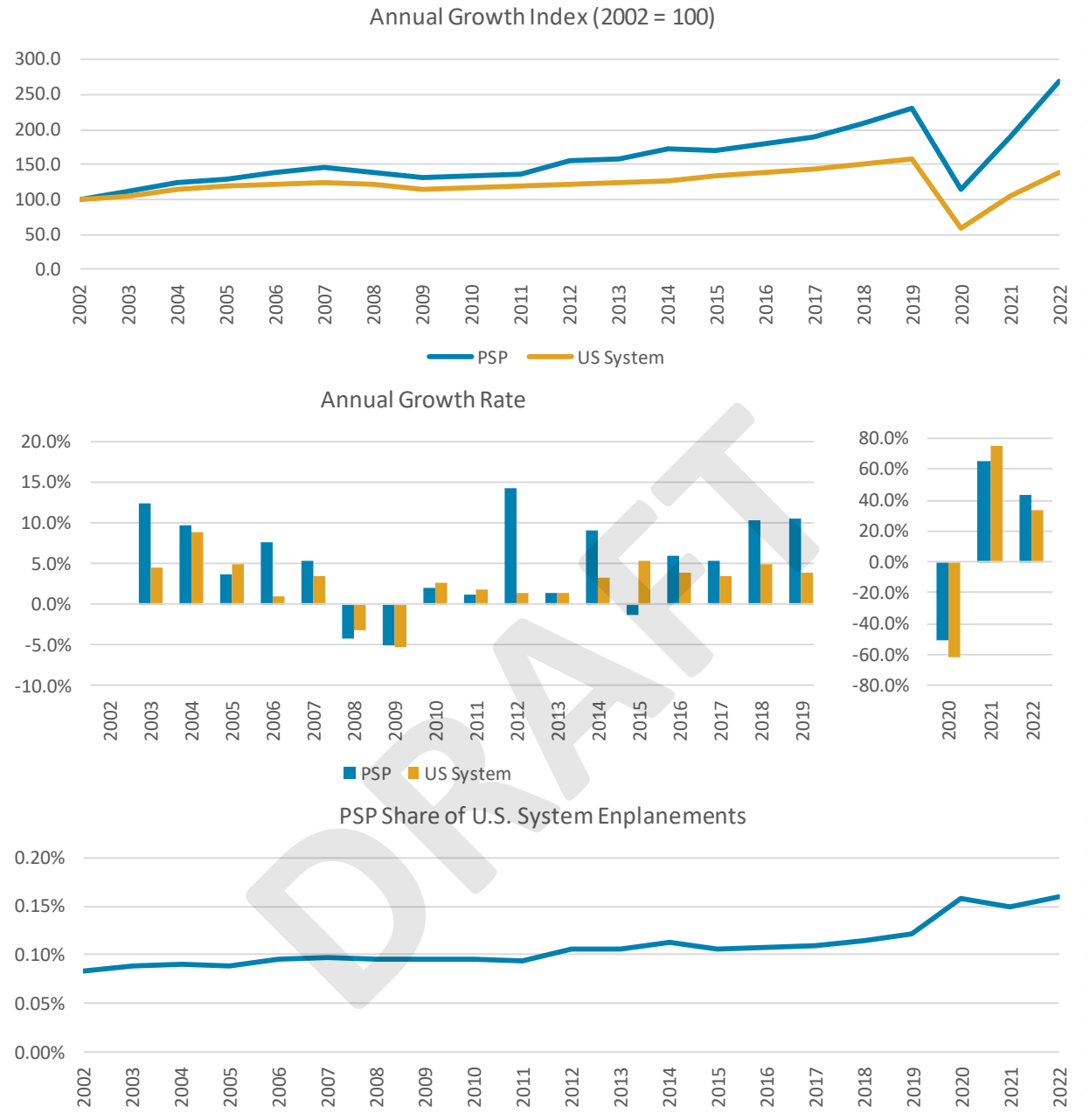
From 2002 to 2022, PSP consistently exceeded the U.S. system growth trends. In particular, PSP experienced significantly higher year-over-year growth in 2003, 2006, 2012, 2014, 2018, and 2019. In 2012, PSP recorded its highest annual pre-pandemic growth, with enplanements rising 14.3 percent while the national trend only grew by 1.4 percent.

Even though PSP remains classified as a small hub by the FAA, its faster growth relative to national trend is reflected in its growing share of total U.S. enplanements. Its market share doubled from 0.08 percent in 2002 to 0.16 percent in 2022.[2] Much of the growth PSP's market share occurred during the height of the COVID-19 pandemic in 2020. Although both PSP and the U.S. system experienced significant decline in 2020, PSP's decrease was smaller (50.9 percent versus the U.S. system's 62.1 percent), leading PSP's share size to grow from 0.12 percent in 2019 to 0.16 percent in just one year.

Figure 2-2 compares the enplanement growth trends of PSP with that of the larger nationwide aviation system.

[2] FAA defines a small hub as an airport enplaning between 0.05 to 0.25 percent of total U.S. enplanements.

Figure 2-2: PSP vs. U.S. System Enplanement Growth Trends



Sources: *Airport records for PSP and Bureau of Transportation Statistics for U.S. system.*

Table 2-2 shows the underlying data for the comparison and analysis of PSP versus U.S. system enplanements.

Table 2-2: PSP vs. U.S. Annual Enplanements

Annual Enplanements					
	PSP		US System		PSP Share
Year	EP (1000s)	AGR	EP (1000s)	AGR	of U.S.
2002	557		670,604		0.08%
2003	626	12.4%	700,864	4.5%	0.09%
2004	686	9.6%	763,710	9.0%	0.09%
2005	712	3.7%	800,850	4.9%	0.09%
2006	767	7.7%	808,103	0.9%	0.09%
2007	808	5.4%	835,510	3.4%	0.10%
2008	774	-4.2%	809,822	-3.1%	0.10%
2009	735	-5.0%	767,817	-5.2%	0.10%
2010	750	2.0%	787,478	2.6%	0.10%
2011	758	1.1%	802,135	1.9%	0.09%
2012	866	14.3%	813,123	1.4%	0.11%
2013	877	1.3%	825,322	1.5%	0.11%
2014	957	9.1%	851,850	3.2%	0.11%
2015	945	-1.3%	896,632	5.3%	0.11%
2016	1,002	6.1%	931,989	3.9%	0.11%
2017	1,055	5.3%	964,765	3.5%	0.11%
2018	1,164	10.4%	1,013,213	5.0%	0.11%
2019	1,287	10.6%	1,052,981	3.9%	0.12%
2020	632	-50.9%	398,655	-62.1%	0.16%
2021	1,048	65.7%	700,560	75.7%	0.15%
2022	1,501	43.2%	935,445	33.5%	0.16%
Compound Annual Growth Rate					
2002-2010	3.8%		2.0%		
2010-2019	6.2%		3.8%		
2019-2022	5.2%		-3.9%		
2010-2022	6.0%		1.4%		
2002-2022	5.1%		1.7%		

Sources: *Airport records for PSP and Bureau of Transportation Statistics for U.S. system.*

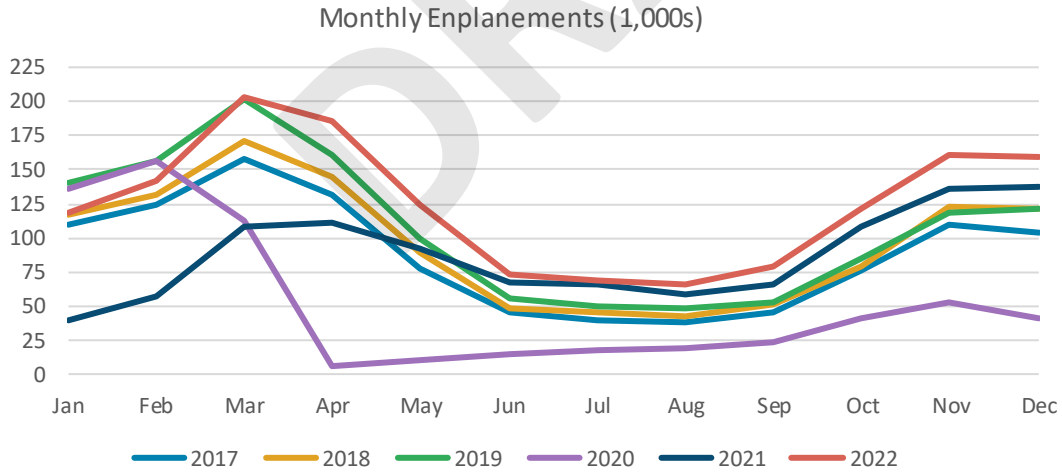
Monthly Enplanement Trends

Figure 2-3 shows PSP's monthly enplanement levels over the past six years from 2017 through 2022, while **Table 2-3** breaks down each year into its monthly enplanement shares (and dates further back to 2014).

Except in 2020 and 2021, PSP's seasonal patterns have been consistent over the years. Passenger activity peaks in March and gradually declines through August before rising again through November. PSP has similar enplanement levels between November and December, as travelers are drawn to PSP's moderate winters.

The COVID-19 pandemic temporarily disrupted PSP's usual seasonality with a dramatic drop from February 2020 to April 2020, with air traffic levels remaining much lower than typical patterns through the rest of the year. Enplanement recovery began to pick up in early 2021 when COVID-19 vaccines saw widespread distribution. By May 2021, PSP's enplanements had reached a level on par with the same month of pre-pandemic years. By June 2021 and onward, air traffic returned to usual patterns and held the pattern at a level above that of pre-pandemic years. The building surge of infections due to the omicron variant caused California to issue a travel advisory and statewide indoor mask mandate (regardless of vaccination status) from December 2021 through February 2022.[3] Alongside the Omicron-related fifth wave leading to the pandemic's peak number of infections by over three-fold, these factors caused monthly enplanements in early 2022 to dip below 2019 levels, but by March had returned to maintaining its pattern above pre-pandemic levels.

Figure 2-3: PSP Monthly Enplanement Trends



Source: *Airport records.*

[3] Richard Procter, "Remember when? Timeline marks key events in California's year-long pandemic grind," *CalMatters*, March 2021, https://calmatters.org/health/coronavirus/2021/03/timeline-california-pandemic-year-key-points/.

Table 2-3: PSP Monthly Distribution of Enplanements

Monthly Enplanement Shares									
Month	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Jan	10.3%	10.9%	10.1%	10.3%	10.1%	10.9%	21.5%	3.8%	7.9%
Feb	11.4%	12.5%	12.5%	11.7%	11.4%	12.2%	24.8%	5.5%	9.5%
Mar	14.8%	15.7%	15.1%	14.9%	14.7%	15.6%	17.9%	10.3%	13.5%
Apr	12.7%	12.8%	12.2%	12.4%	12.4%	12.5%	0.9%	10.6%	12.4%
May	8.3%	7.9%	7.6%	7.3%	7.6%	7.7%	1.7%	8.9%	8.2%
Jun	4.5%	4.0%	4.1%	4.2%	4.2%	4.3%	2.3%	6.4%	4.9%
Jul	3.9%	3.5%	3.7%	3.7%	3.9%	3.9%	2.7%	6.3%	4.5%
Aug	3.8%	3.7%	3.8%	3.6%	3.6%	3.7%	2.9%	5.6%	4.4%
Sep	4.5%	4.1%	4.3%	4.3%	4.3%	4.1%	3.7%	6.3%	5.3%
Oct	6.8%	6.7%	7.1%	7.2%	6.8%	6.6%	6.6%	10.4%	8.0%
Nov	9.5%	9.3%	10.1%	10.4%	10.5%	9.1%	8.4%	13.0%	10.7%
Dec	9.4%	9.0%	9.3%	9.9%	10.5%	9.4%	6.6%	13.1%	10.7%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

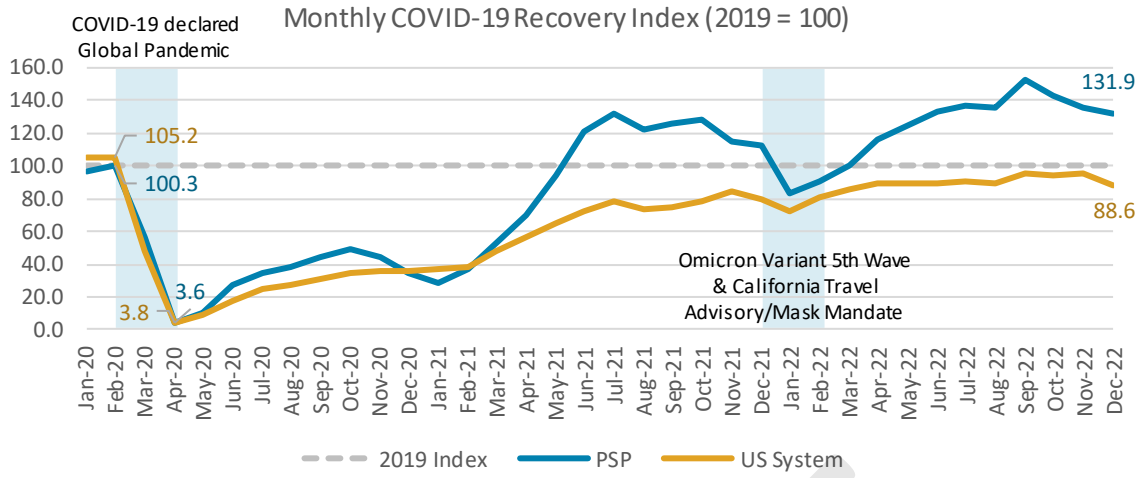
Third largest share percentage of annual total.
Second largest share percentage of annual total.
Largest share percentage of annual total.

Third smallest share percentage of annual total.
Second smallest share percentage of annual total.
Smallest share percentage of annual total.

Source: *Airport records.*

Figure 2-4 compares the monthly enplanement recovery trends over the course of the COVID-19 pandemic, indexed to the corresponding month in 2019. Since the initial drop in air traffic through March and April 2020, PSP's recovery has almost entirely outpaced that of the U.S. system, briefly dipping below national trends in the winter of 2020/2021. The distribution of COVID-19 vaccines accelerated PSP's recovery further than the national recovery, widening the gap in their trends. This gap tightened in January 2022 when the omicron variant of COVID-19 led to peak infection rates, a California travel advisory, and a reinstated mask mandate, all of which hampered PSP's recovery more than the national recovery. However, the Airport soon continued to outpace the U.S. system in the following months as the fifth wave of infections tapered off. PSP's recovery index had been on a decline in the fourth quarter of 2022, but by December 2022, PSP's enplanements still sat well above the U.S. system at 131.9 percent of its 2019 level (versus the U.S. system's 88.6 percent).

Figure 2-4: Monthly COVID-19 Recovery Trends (2019 = 100)



Source: *Airport records for PSP and Bureau of Transportation Statistics for U.S. system.*

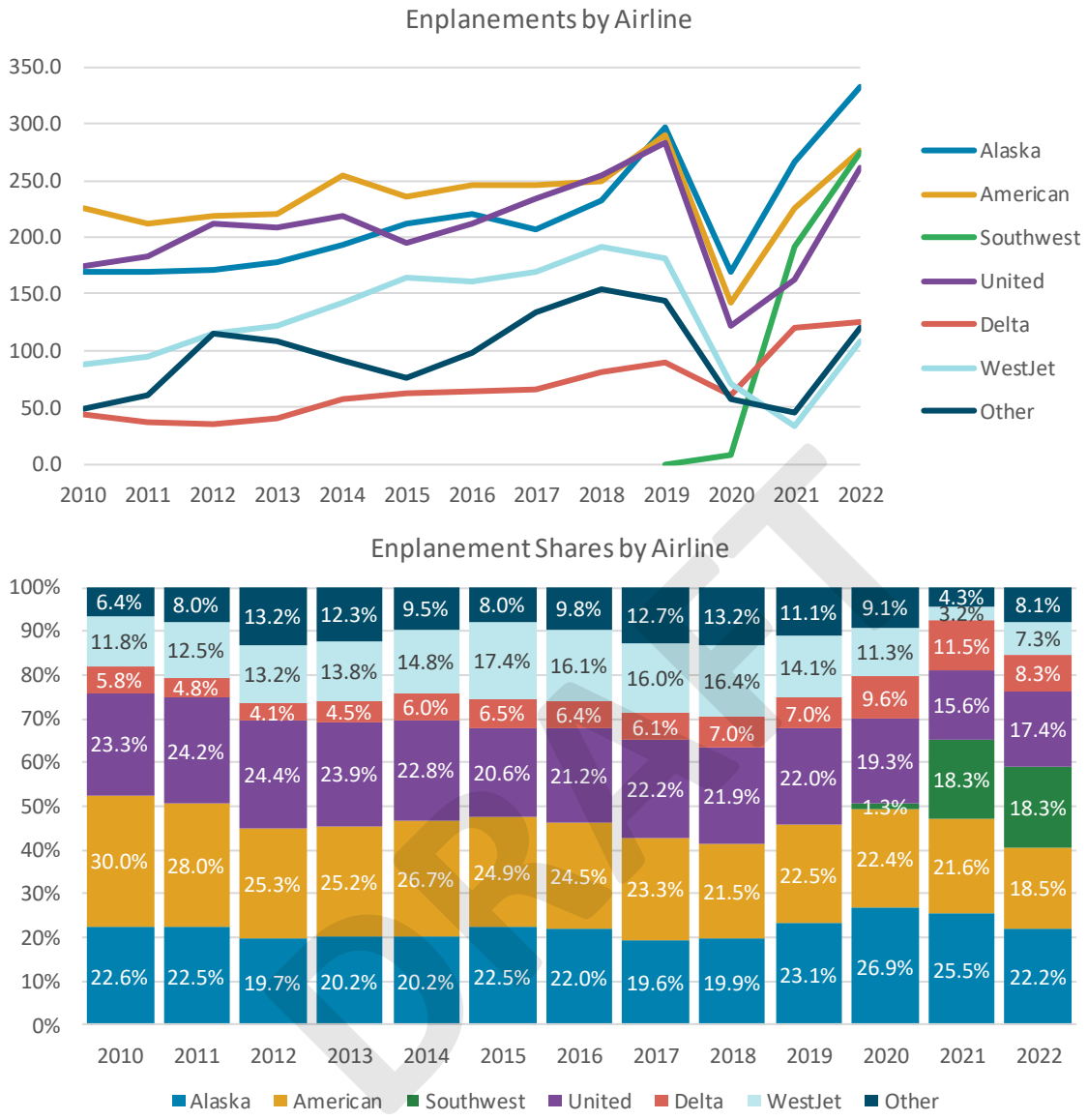
AIRLINE MARKET SHARES

As shown in **Figure 2-5**, in 2022, Alaska held the largest market share at 22.2 percent, followed by American (18.5 percent), followed by Southwest (18.3 percent), followed by United (17.4 percent), and then Delta (8.3 percent) and WestJet (7.3 percent). The remaining 8.1 percent share is made up of PSP's remaining airlines (the "Other" category). **Table 2-4** shows the underlying data for annual airline enplanements.

Throughout the 2010s, there had been significant changes in the composition of air carriers at the Airport. Initially, American held the largest share of the PSP market, around 30.0 percent, with roughly 225,000 enplanements. However, as the growth in other airlines began to surpass American's, its market share began to fall and was down to 18.5 percent by the end of 2022. Since 2019, Alaska has overtaken American as the largest airline at PSP.

Southwest began servicing PSP in 2020, capturing just 1.3 percent of market share. Over the next two years, Southwest's activity at the Airport grew rapidly, surpassing WestJet, Delta, and United, establishing itself as the third largest carrier by the end of 2021. Due to international travel restrictions between Canada and the United States, WestJet faced a continued decline in 2021. Other airlines began recovery in the same year, causing its share to fall below Delta and the collective share of airlines in the "Other" category.

Figure 2-5: Enplanement Trends by Airline



Source: *Airport records.*

Table 2-4: Annual Enplanements and Market Shares by Airline

Enplanements by Airline (Thousands)														CAGR		
Airline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2010-2019	2019-2022	2010-2022
Alaska	169.3	170.3	170.7	177.5	193.7	212.7	220.0	206.7	232.2	298.0	170.3	267.0	333.5	6.5%	3.8%	5.8%
American	225.1	212.5	219.4	221.4	255.2	235.5	245.8	245.8	250.0	290.2	141.9	226.2	277.1	2.9%	-1.5%	1.7%
Southwest										0.0	8.3	191.7	274.9			
United	174.9	183.8	211.4	209.4	218.3	194.7	212.7	234.1	255.4	283.4	122.1	163.0	260.8	5.5%	-2.7%	3.4%
Delta	43.7	36.2	35.6	39.6	57.3	61.6	64.0	64.9	81.7	90.3	60.7	120.3	124.6	8.4%	11.3%	9.1%
WestJet	88.5	94.8	114.4	121.4	141.8	164.4	161.3	169.0	191.4	182.1	71.7	33.8	108.8	8.3%	-15.8%	1.7%
Other	48.1	60.5	114.7	108.1	91.0	75.8	98.3	134.2	153.7	143.5	57.4	45.5	120.9	12.9%	-5.5%	8.0%
Total	**749.7**	**758.0**	**866.1**	**877.5**	**957.2**	**944.6**	**1002.0**	**1054.8**	**1164.3**	**1287.5**	**632.3**	**1047.6**	**1500.6**	**6.2%**	**5.2%**	**6.0%**
AGR		1.1%	14.3%	1.3%	9.1%	-1.3%	6.1%	5.3%	10.4%	10.6%	-50.9%	65.7%	43.2%			

Enplanement Shares by Airline													
Airline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Alaska	22.6%	22.5%	19.7%	20.2%	20.2%	22.5%	22.0%	19.6%	19.9%	23.1%	26.9%	25.5%	22.2%
American	30.0%	28.0%	25.3%	25.2%	26.7%	24.9%	24.5%	23.3%	21.5%	22.5%	22.4%	21.6%	18.5%
Southwest											1.3%	18.3%	18.3%
United	23.3%	24.2%	24.4%	23.9%	22.8%	20.6%	21.2%	22.2%	21.9%	22.0%	19.3%	15.6%	17.4%
Delta	5.8%	4.8%	4.1%	4.5%	6.0%	6.5%	6.4%	6.1%	7.0%	7.0%	9.6%	11.5%	8.3%
WestJet	11.8%	12.5%	13.2%	13.8%	14.8%	17.4%	16.1%	16.0%	16.4%	14.1%	11.3%	3.2%	7.3%
Other	6.4%	8.0%	13.2%	12.3%	9.5%	8.0%	9.8%	12.7%	13.2%	11.1%	9.1%	4.3%	8.1%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: *Airport records.*

SCHEDULED PASSENGER SERVICE

Table 2-5 and **Figure 2-6** show the scheduled service trends at PSP from 2018 through the advance schedules of 2023, with three different measures: number of nonstop destinations, average daily departures, and average daily seats.

Across all three measures, PSP's scheduled service has exhibited strong growth over the past six years, helped in part by the addition of Southwest and its quick expansion in the Airport. The total number of unique nonstop destinations served at PSP rose from 20 in 2018 to 34 in 2023, peaking in 2022 with 39 destinations. Despite falling during the pandemic, PSP's average daily departures increased from 40 in 2019 to 43 by 2023. Its average daily seats increased from 4,487 in 2019 to an average of 5,516 in 2023.

In the years leading up to the COVID-19 pandemic, United was the largest presence at PSP in terms of departures, averaging 10 departures per day in 2018 and 11 per day in 2019. During the pandemic, Alaska narrowly surpassed United's daily average departures. As of 2023's advance schedules, both United and Alaska show an even average of 10 scheduled departures per day, leading ahead of American and Southwest with an average of 7 and 6 per day, respectively. Delta and WestJet trail slightly behind with an average of 4 and 3 daily departures respectively, and the remaining airlines are scheduled to operate a daily average of 2 departures collectively.

Broken down by airlines, Alaska had the highest capacity in terms of daily average seats before the pandemic, followed by United. Since the pandemic, Southwest has surpassed United in 2022, though by a small margin in 2022 (1,191 average daily seats versus Alaska's 1,171). Based on advance schedules for 2023, Alaska is set to return to the market leader in terms of seat capacity in 2023, with an average of 1,097 scheduled seats per day (which now exceeds its pre-pandemic numbers), followed by Southwest and United with a daily average of 1,023 and 1,022 seats, respectively. American trails behind with an average of 999 daily scheduled seats, though it has exceeded its 2019 pre-pandemic level. WestJet and Delta are expected to have a daily average of 521 and 482 scheduled seats in 2023, respectively, and the remaining airlines are expected to have a daily average of 371 scheduled seats.

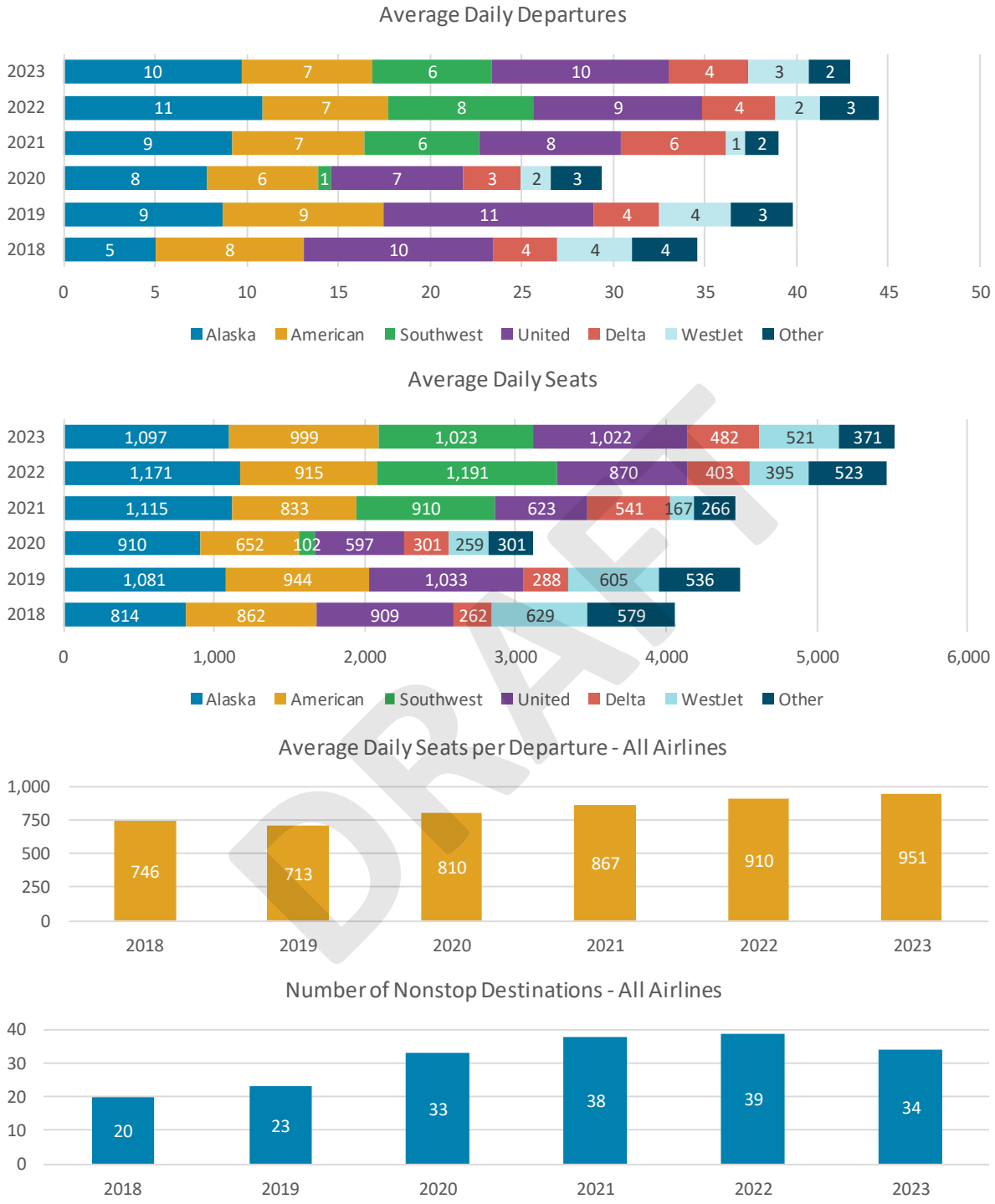
By nature of being composed of multiple distinct air carriers, the "Other" category has consistently served the highest number of unique destinations. The number of destinations served by this group of air carriers spiked during the pandemic, reaching a peak of 18 unique destinations in 2021. Advance schedules show a slight retreat from this large number of destinations, down to 12 unique destinations in 2023, though it still far exceeds the number of destinations served by PSP's six other airlines.

Table 2-5: Scheduled Passenger Service at PSP

Scheduled Service at PSP						
Airline	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Alaska						
Number of Nonstop Destinations	4	5	6	8	7	6
Average Daily Departures	5	9	8	9	11	10
Average Daily Seats	814	1,081	910	1,115	1,171	1,097
American						
Number of Nonstop Destinations	3	4	4	4	5	5
Average Daily Departures	8	9	6	7	7	7
Average Daily Seats	862	944	652	833	915	999
Southwest						
Number of Nonstop Destinations	0	0	3	8	10	8
Average Daily Departures	0	0	1	6	8	6
Average Daily Seats	0	0	102	910	1,191	1,023
United						
Number of Nonstop Destinations	6	6	7	5	5	6
Average Daily Departures	10	11	7	8	9	10
Average Daily Seats	909	1,033	597	623	870	1,022
Delta						
Number of Nonstop Destinations	4	4	5	5	4	4
Average Daily Departures	4	4	3	6	4	4
Average Daily Seats	262	288	301	541	403	482
WestJet						
Number of Nonstop Destinations	5	5	4	4	4	4
Average Daily Departures	4	4	2	1	2	3
Average Daily Seats	629	605	259	167	395	521
Other						
Number of Nonstop Destinations	11	13	17	18	16	12
Average Daily Departures	4	3	3	2	3	2
Average Daily Seats	579	536	301	266	523	371
All Airlines						
Number of Nonstop Destinations	20	23	33	38	39	34
Average Daily Departures	35	40	29	39	45	43
Average Daily Seats	4,054	4,487	3,122	4,455	5,468	5,516

Source: *OAG Schedules Analyzer, last accessed March 4, 2023.*

Figure 2-6: Scheduled Passenger Service Trends



Source: *OAG Schedules Analyzer, last accessed March 4, 2023.*

TOP DOMESTIC O&D MARKETS

Table 2-6 and **Figure 2-7** show PSP's top 25 O&D markets through the available months of 2022 (currently January through September 2022, as of the time of writing), ranked by share of the Airport's total 2022 O&D enplanements.

Altogether, the top 25 markets make up 70.9 percent of O&D enplanements at PSP. Seattle-Tacoma International Airport (SEA) holds the largest share of 12.9 percent in 2022. San Francisco International Airport (SFO) holds the second largest share of 8.8 percent—the rest of the top 5 consists of Portland International Airport (PDX) with a 5.5 percent share, Denver International Airport (DEN) with a 4.4 percent share, and Minneapolis−Saint Paul International Airport (MSP) with a 4.3 percent share.

The top three states found in PSP's top 25 O&D markets include—in descending order of their O&D enplanement share—California, Washington, and Oregon. While SEA in Washington holds the largest share of PSP's O&D market as an individual airport, California holds the largest collective market share at the state level. Four of PSP's top 25 O&D destinations are California airports, accounting for a share size of 17.3 percent. Washington is the second largest state market, with three of its airports in PSP's top 25 O&D destinations, and a share size of 15.1 percent. Oregon is third—despite having only one airport in PSP's top 25 O&D markets, PDX accounted for a 5.5 percent share in 2022, which alone exceeds that of Texas with 3 airports and a 4.9 percent share.

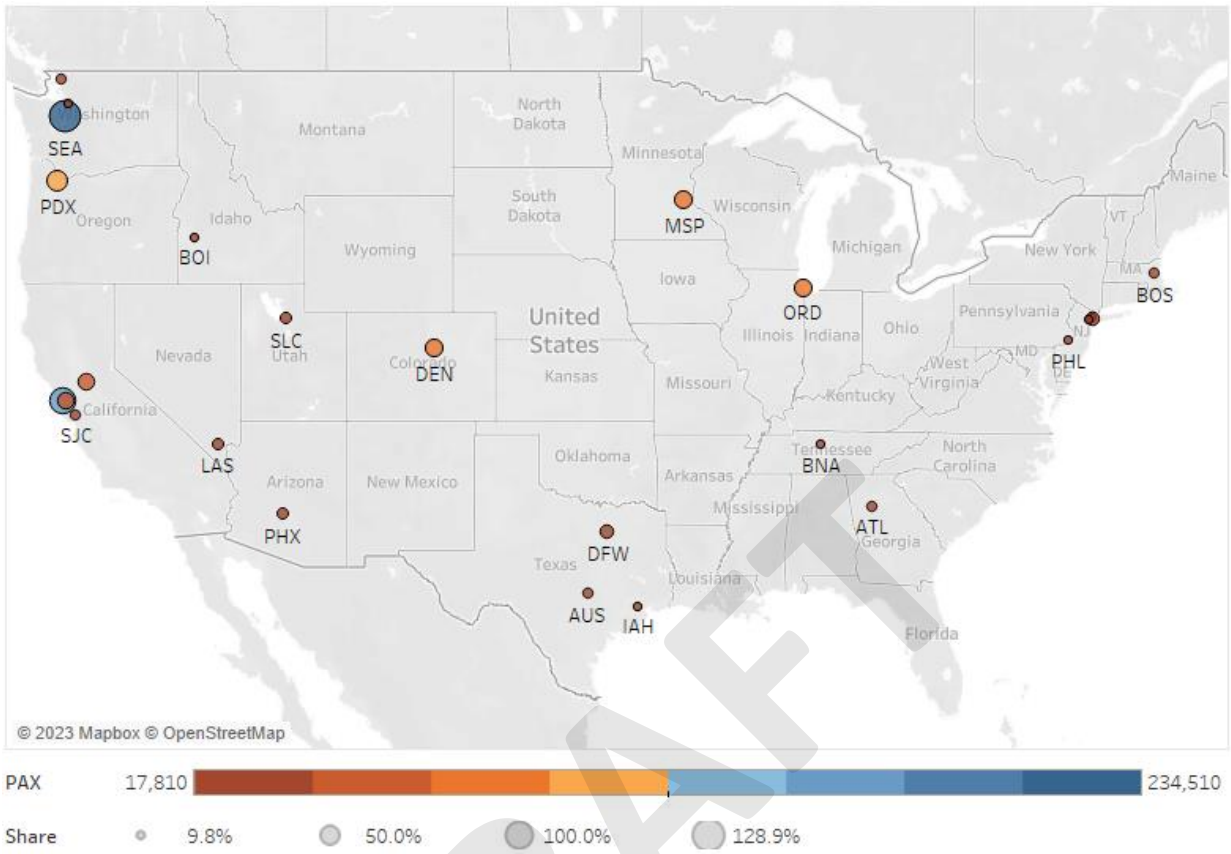
Table 2-6: PSP Top 25 O&D Markets, January-September YTD 2022

PSP Top 25 O&D Markets, 2022						
Rank	Airport	City	State	PAX	Daily Avg	Share
1	SEA	Seattle	WA	234,510	642.5	12.9%
2	SFO	San Francisco	CA	159,600	437.3	8.8%
3	PDX	Portland	OR	99,830	273.5	5.5%
4	DEN	Denver	CO	79,470	217.7	4.4%
5	MSP	Fort Snelling	MN	79,000	216.4	4.3%
6	ORD	Chicago	IL	73,120	200.3	4.0%
7	OAK	Oakland	CA	67,600	185.2	3.7%
8	SMF	Sacramento	CA	64,540	176.8	3.5%
9	DFW	Dallas	TX	44,620	122.2	2.5%
10	JFK	New York	NY	42,280	115.8	2.3%
11	PHX	Phoenix	AZ	35,750	97.9	2.0%
12	LAS	Las Vegas	NV	30,570	83.8	1.7%
13	SLC	Salt Lake City	UT	29,210	80.0	1.6%
14	AUS	Austin	TX	26,650	73.0	1.5%
15	BOS	Boston	MA	25,700	70.4	1.4%
16	SJC	San Jose	CA	23,790	65.2	1.3%
17	BLI	Bellingham	WA	21,330	58.4	1.2%
18	ATL	Atlanta	GA	21,310	58.4	1.2%
19	LGA	New York	NY	19,990	54.8	1.1%
20	PAE	Everett	WA	19,690	53.9	1.1%
21	BOI	Boise	ID	18,960	51.9	1.0%
22	BNA	Nashville	TN	18,920	51.8	1.0%
23	IAH	Houston	TX	18,130	49.7	1.0%
24	PHL	Philadelphia	PA	17,940	49.2	1.0%
25	EWR	Newark	NJ	17,810	48.8	1.0%
Top 25 Subtotal				**1,290,320**	**3,535.1**	**70.9%**
Other				**528,950**	**6,427.8**	**29.1%**
Total				**1,819,270**	**12,418.2**	**100.0%**

Source: *DB1B, last accessed March 23, 2023.*

Note: *PAX amounts are estimates based on the DB1B sample, rounded to nearest 10.*

Figure 2-7: PSP Top 25 O&D Market Map, January-September YTD 2022



Source: *DB1B, last accessed March 23, 2023.*

Note: *PAX amounts are estimates based on the DB1B sample, rounded to nearest 10.*

COMPARISON WITH OTHER AIRPORTS

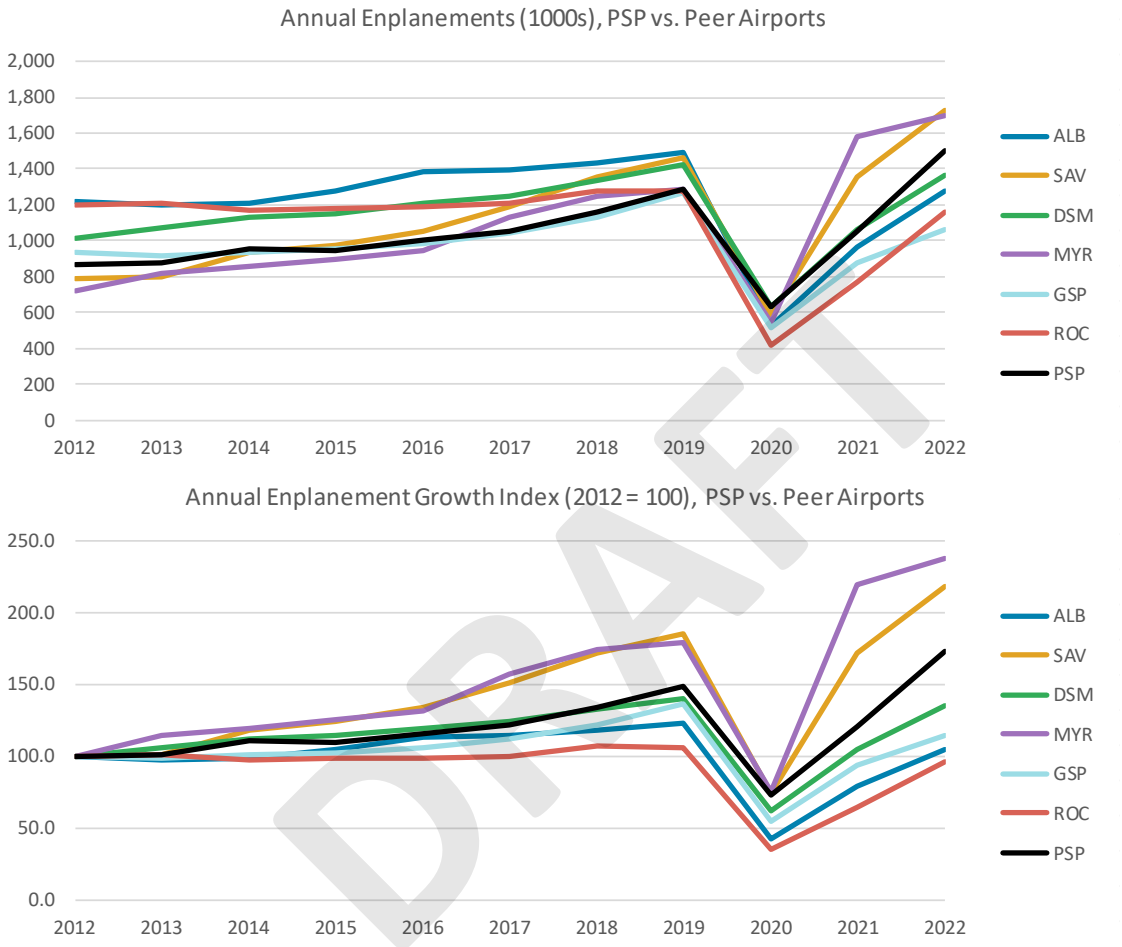
This subsection compares PSP's air traffic and market fare history with two sets of six airports. The first six are airports with the closest enplanement count to PSP, based on 2019 pre-pandemic rankings. These airports include Albany International (ALB), Savannah/Hilton Head International (SAV), and Des Moines International (DSM) as the three closest airports directly above PSP's 2019 enplanement count, as well as Myrtle Beach International (MYR), Greenville Spartanburg International (GSP), and Greater Rochester International (ROC) as the three closest airports directly below PSP's 2019 enplanement count. The second set are six airports also based in Southern California: Los Angeles International (LAX), San Diego International (SAN), John Wayne (SNA), Long Beach (LGB), Ontario International (ONT), and Hollywood Burbank—also known as Bob Hope (BUR).

Comparison of Enplanement Trends with Peer Airports

Relative to its peers, the growth in PSP's enplanements has quickened since the pandemic. Prior to the pandemic, both of PSP's enplanement level and growth had largely ranked in the lower half among peer

airports However, due to it being less impacted by the pandemic and its faster rebound, PSP's enplanement levels and growth in 2021 and 2022 have surpassed most of its peer airports (except for MYR and SAV). It now ranks third both in terms of enplanement levels and growth. **Figure 2-8** details the regional enplanement growth trends of PSP and its neighboring airports.

Figure 2-8: Growth Trends for PSP vs. Airports of Closest 2019 Enplanements



Sources: *Airport records for PSP and Bureau of Transportation Statistics for other airports.*

Comparison of Airline Fare and Passenger Yield Trends with Peer Airports

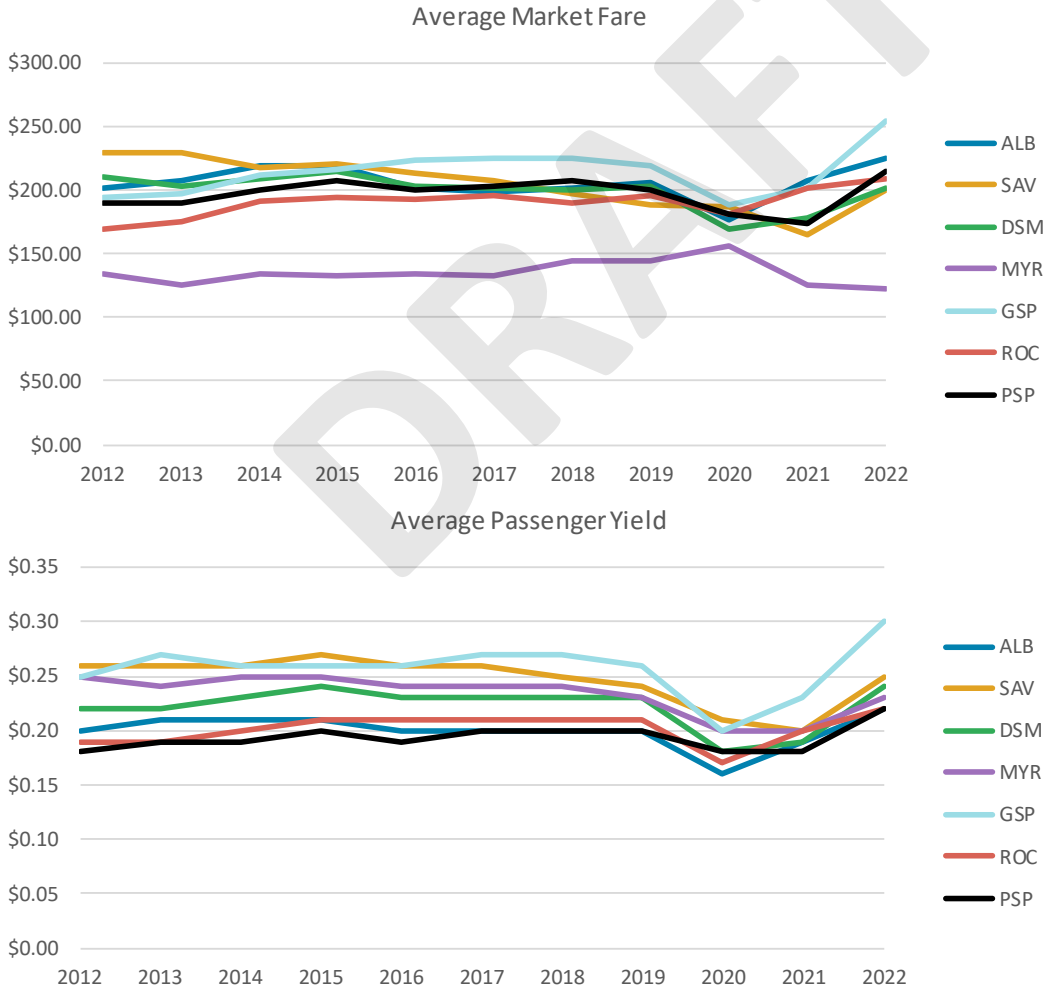
Lower airfares attract passengers. **Figure 2-9** compares the average market fares and average passenger yields at PSP and its peer airports from 2012 to 2022. Passenger yield—defined as the average airline revenue per revenue passenger mile—is similar to average market fare but controls for trip length.

Prior COVID-19, PSP's average market fare stayed between 190 and 210 dollars. This kept the Airport's fare in the lower half of its peers until 2017, when the steady decreases in ALB and DSM's fares eventually put them below PSP. SAV's steadily decreasing market fare also fell below PSP in 2018, though PSP's own

slight reduction in market fare placed it into the median among its peers in 2019. PSP's average market fare saw continued decreases through 2020 and 2021 during the COVID-19 pandemic. In 2022, the downward trend reversed—due to inflation, staffing and equipment shortages, and elevated air travel demand—PSP saw a sharp increase from 174 to 214 dollars, which nudged PSP's average market fare to the third highest among sampled peer airports.

Compared to its peer airports, PSP's average passenger yield ranks one of the lowest. In fact, prior to the pandemic, all of the Airports' passenger yields had remained relatively flat. During this period, PSP's annual average passenger yields ranged between 0.18 and 0.20 dollars, which among the lowest of the seven sampled airports. PSP's yield had a relatively flatter decrease than the other airports at the beginning of the COVID-19 pandemic, from 0.20 in 2019 to 0.18 dollars in 2020. As of September 2022, its average passenger yield rose slightly to 0.22 dollars, though it remains one of the lowest among peer airports.

Figure 2-9: Average Market Fare and Yield, PSP vs. Airports of Closest 2019 Enplanements

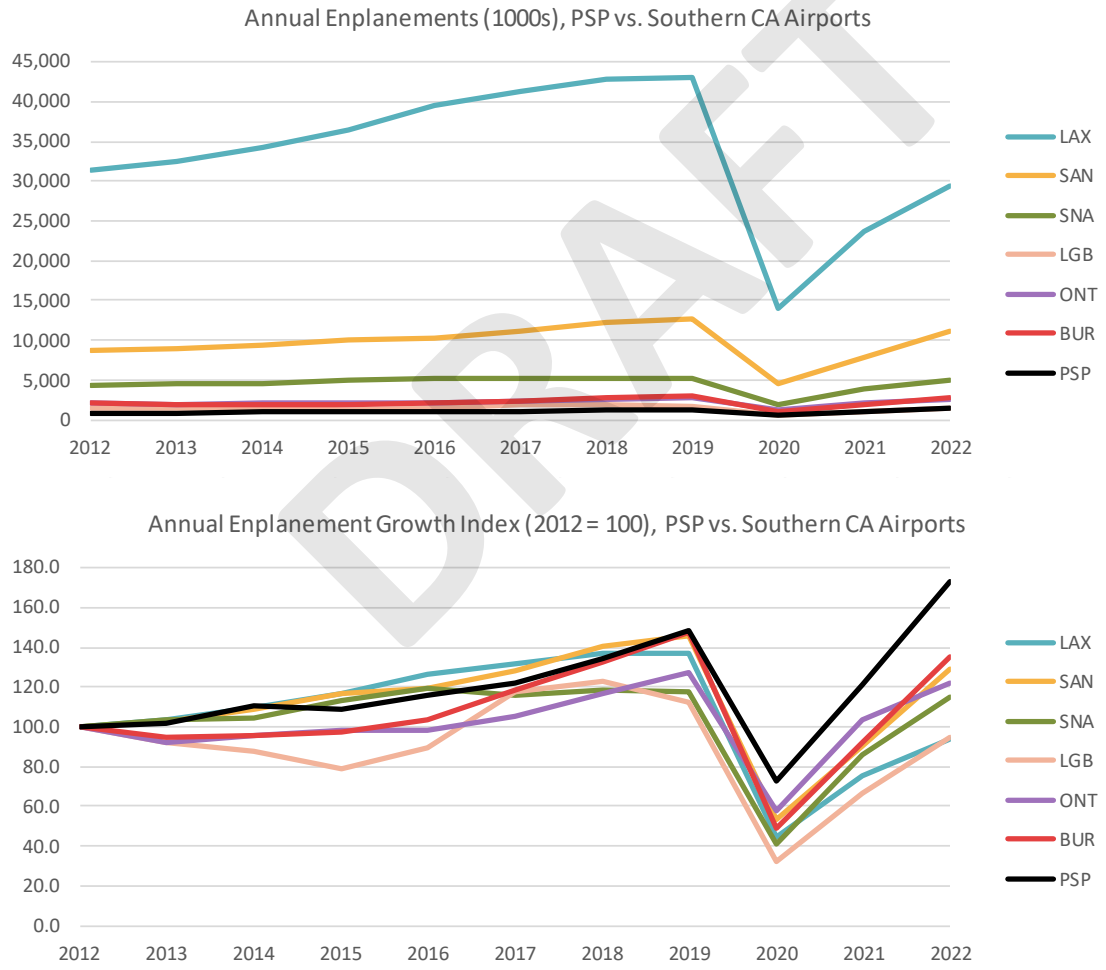


Source: *DB1B.*

Comparison of Enplanement Trends with Southern California Airports

PSP's enplanement history was on the lower end of the sample for Southern California airports, consistently holding the least number of enplanements throughout the 2010s (Figure 2-10). Most Southern California airports have not been too far above PSP, though SNA shows the first gap, likely due to being a medium hub airport. From there, SAN maintains the next gap over SNA in enplanements, due to being a large hub airport. Naturally, LAX holds the farthest lead over the other airports, as it is one of the most active airports in the United States. However, upon the downturn in 2020 from the COVID-19 pandemic, PSP experienced a less severe decline compared to other Southern California airports, putting its enplanements just above LGB. PSP maintained this slight lead over LGB through the next two years of pandemic recovery.

Figure 2-10:Growth Trends for PSP vs. Southern California Airports



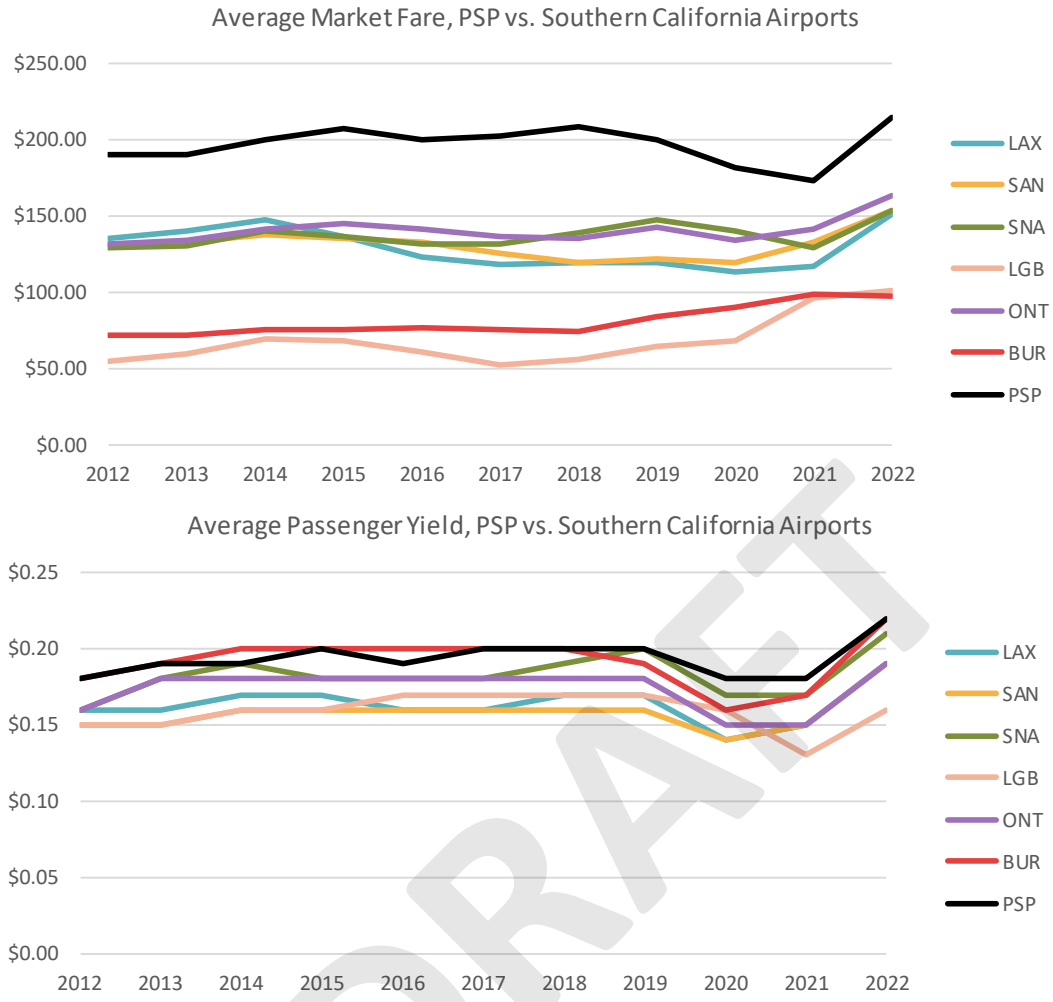
Sources: *Airport records for PSP and Bureau of Transportation Statistics for other airports.*

Comparison of Airline Fare and Passenger Yield Trends with Southern California Airports

Figure 2-11 compares PSP's average market fare and yield with that of the other six sample Southern California airports. PSP maintained the highest average market fare throughout the past decade, hovering between $190 and $210 until dipping down to $181.17 and $173.67 in 2020 and 2021, respectively. Since then, however, PSP's market fare increased significantly, up to $214.36 in 2022. LAX, SAN, SNA, and ONT all sit near each other in average market fare, at a substantial level below PSP. Below those airports with another notable gap are BUR and LGB, which sit at the bottom two for average market fare, having only neared or barely passed $100 in recent post-pandemic years.

All seven airports are closer together in average yield than average market fare, ranging from $0.15 to $0.20, though PSP has often held or tied for the highest average yield throughout the available history. PSP's average yield declined to $0.18 in 2020 and 2021, though that was still the highest at the time compared to the other Southern California airports. In 2022, PSP surpassed its previous highest average yield, now with an average of $0.22, equal to BUR after that airport experienced its own sharp increase that year. LGB currently sits at the bottom of the sample, with an average yield of $0.16, due to having not as strong a recovery as other Southern California airports during the pandemic.

Figure 2-11: Average Market Fare and Yield, PSP vs. Southern California Airports

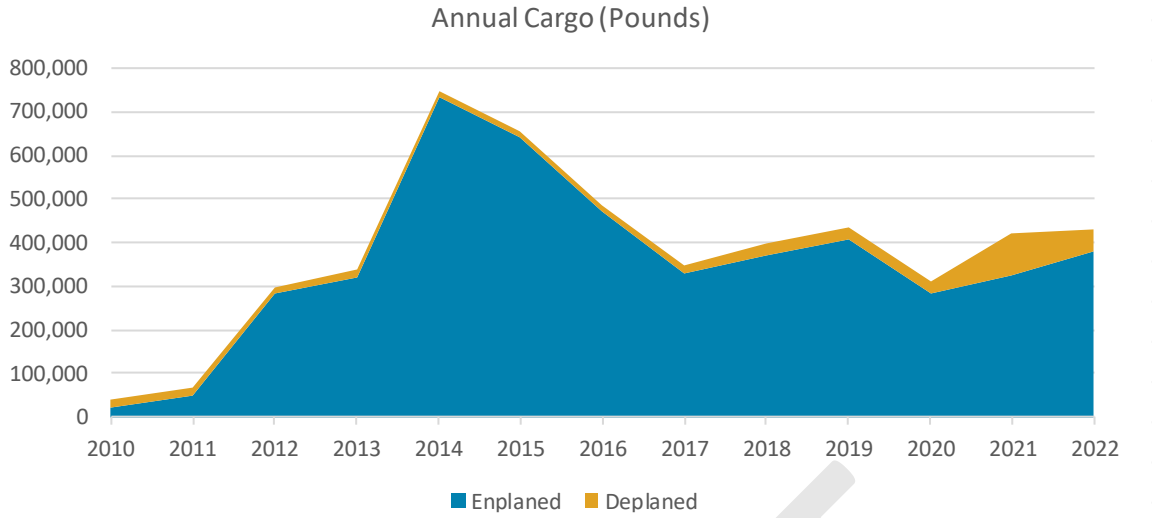


Source: *DB1B.*

AIR CARGO

Figure 2-12 charts PSP's annual air cargo trends, broken down by enplaned and deplaned cargo, while PSP has seen limited growth in air cargo since 2014. Most cargo at the Airport is enplaned, though deplaned cargo began gaining a larger share since the COVID-19 pandemic. In fact, PSP enplaned almost no cargo until 2012, when enplaned cargo increased from 47,235 in 2011 to 281,043 pounds in 2012. Cargo activity at PSP saw a spike in 2014, rising from 336,969 pounds to a peak of 749,041 pounds. From there, PSP's cargo activity declined over the next few years through 2017, and currently sits at 430,806 enplaned and deplaned pounds as of 2022.

Figure 2-12: Annual Air Cargo Trends



Source: *Airport records.*

Table 2-7 breaks down the Airport's annual cargo by each airline's enplaned and deplaned total weight. PSP is not served by any all-cargo carriers, and thus all recorded cargo at the Airport is belly cargo on scheduled passenger carriers, almost all of which is from Alaska Airlines. After US Airways ceased its cargo service at the Airport after 2011, Alaska has since accounted for over 99 percent of PSP's air cargo through the rest of the decade. While that share has very slightly shrunk with American, United, and Delta contributing in recent years, Alaska still dominates PSP's air cargo with a 97.7 percent share.

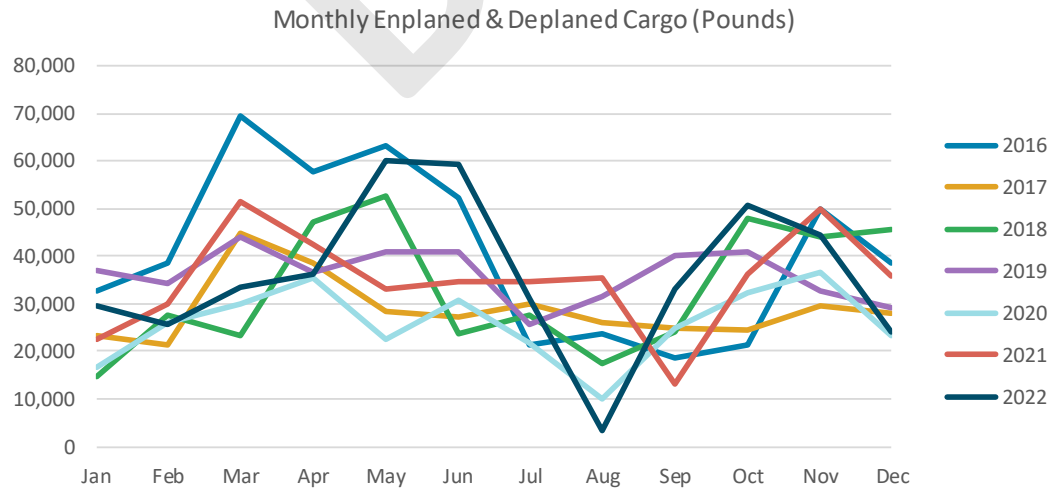
Table 2-7: Annual Enplaned and Deplaned Air Cargo by Airline (in Thousand Pounds)

Annual Cargo by Airline (1,000 Pounds)							
Year	Alaska	American	United	Delta	Horizon	US Airways	Total
2010	32.4				1.6	7.3	41.2
2011	57.1		0.1		1.2	9.2	67.6
2012	294.0		0.2		0.7		294.9
2013	335.9				1.1		337.0
2014	746.4		1.7		0.9		749.0
2015	655.4						655.4
2016	487.2						487.2
2017	344.6	1.5					346.1
2018	391.6	3.8		0.5			396.0
2019	432.8			1.2			434.0
2020	309.7			0.6			310.4
2021	411.9	6.1		0.9			418.9
2022	421.1	6.9	2.5	0.2			430.8
Compound Annual Growth Rate							
2010-2019	33.4%						29.9%
2019-2022	-0.9%			-41.4%			-0.2%
2010-2022	23.8%						21.6%

Source: *Airport records.*

Figure 2-13 shows monthly cargo patterns at PSP from January 2016 through December 2022. PSP's cargo seasonality is very erratic, with the years only loosely following a general pattern of experiencing its highest months in the spring and lowest months in the late summer or early fall.

Figure 2-13: Monthly Cargo Trends



Source: *Airport records.*

COMMERCIAL AIRCRAFT LANDINGS AND LANDED WEIGHT

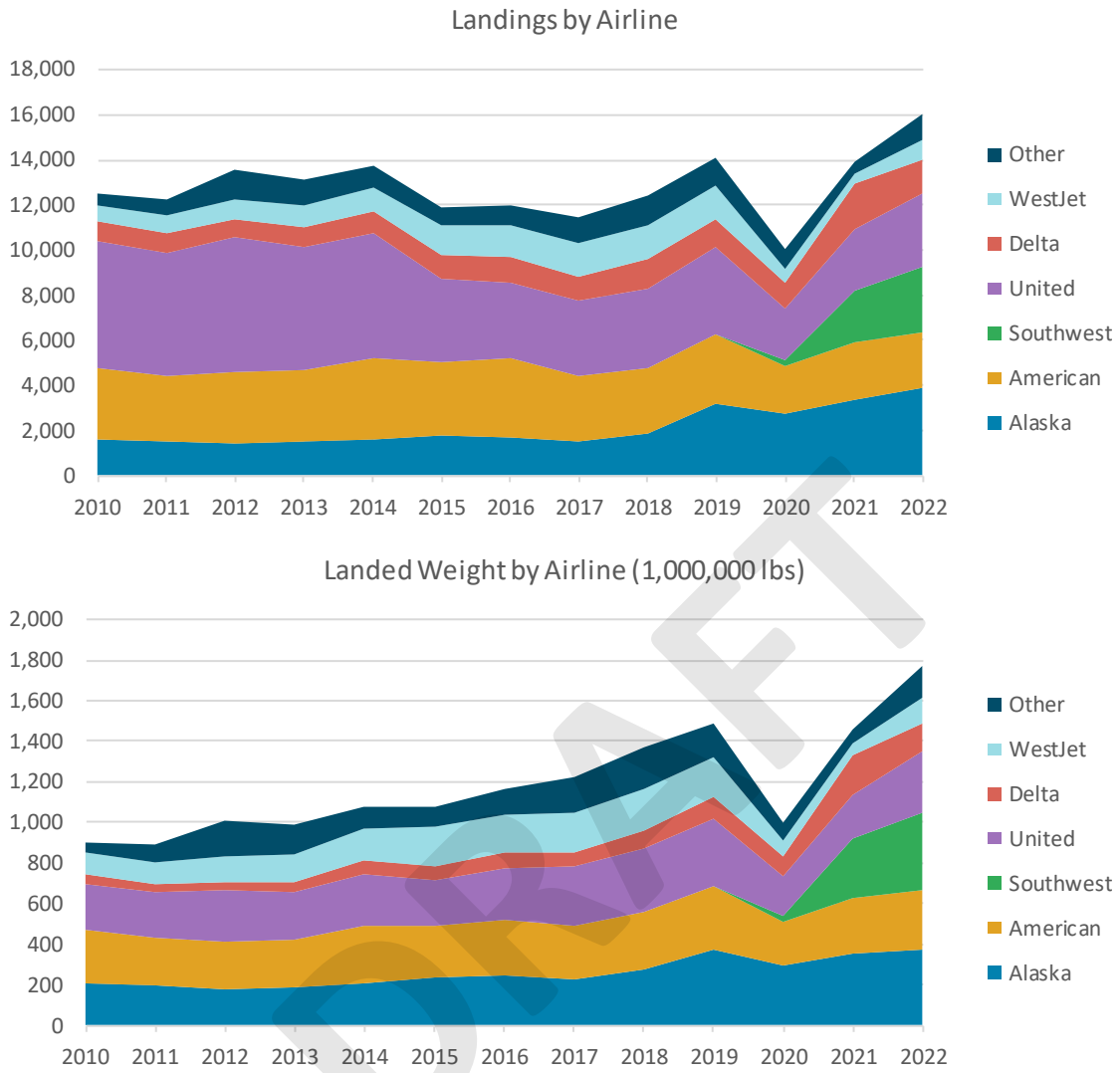
Figure 2-14 shows the annual historical landings and landed weight trends at PSP from 2010 to 2022, broken down by airline. **Table 2-8** and **Table 2-9** break down the underlying data and airline shares, while **Table 2-10** calculates the annual average landed weight per landing by airline.

Over the past decade, the size and capacity of aircraft at PSP have increased, leading to a significant increase in landed weight. In 2010, the average landed weight per landing was 546,491 pounds, which increased to 813,868 pounds in 2022 (a 48.9 percent total increase). Additionally, the number of annual landings increased from 12,534 in 2010 up to 16,005 in 2022 (a 27.7 percent total increase). As a result, annual landed weight increased from 905 million pounds in 2010 up to 1.8 billion pounds in 2022 (a 95.2 percent total increase).

In terms of landings, United was the largest air carrier at PSP, holding 45 percent of the PSP market in 2010. That share has gradually decreased over time, and more recently, with Alaska's expansion in 2020, United has lost its top standing to Alaska. As of 2022, Alaska holds 24.5 percent of landings at the Airport, followed by United with 20.7 percent, Southwest with 17.8 percent, American with 15.3 percent, Delta with 9.2 percent, and WestJet with 5.4 percent. The remaining 7.1 percent share is composed of the remaining airlines outside of the six biggest shares.

In terms of landed weight, United and American competed closely for the largest share of PSP's market before COVID-19 pandemic. Alaska's market share was a close third. Since 2019, Alaska's growth has exceeded that of the United and American, and in 2021, Alaska held the largest share of PSP's market in terms of landing weight. The entry of Southwest in 2020 and its subsequent rapid growth and use of larger, higher capacity aircraft led it to overtake Alaska by the end of 2022 when it comprised 21.2 percent of landed weight at PSP with 375 million pounds, despite having fewer landings than Alaska and American.

Figure 2-14: Annual Landings and Landed Weight Trends



Source: *Airport records.*

Table 2-8: Annual Landings by Airline

Landings by Airline														CAGR		
Airline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2010-2019	2019-2022	2010-2022
Alaska	1,593	1,482	1,434	1,485	1,607	1,747	1,710	1,511	1,811	3,147	2,753	3,317	3,917	7.9%	7.6%	7.8%
American	3,183	2,923	3,148	3,148	3,569	3,315	3,482	2,880	2,930	3,150	2,067	2,576	2,455	-0.1%	-8.0%	-2.1%
Southwest											255	2,275	2,844			
United	5,604	5,496	5,973	5,528	5,545	3,646	3,388	3,327	3,565	3,804	2,338	2,727	3,317	-4.2%	-4.5%	-4.3%
Delta	850	825	789	884	1,003	1,077	1,147	1,121	1,286	1,301	1,135	2,093	1,468	4.8%	4.1%	4.7%
WestJet	751	786	928	965	1,084	1,330	1,351	1,438	1,468	1,420	578	361	863	7.3%	-15.3%	1.2%
Other	553	687	1,249	1,095	907	740	920	1,195	1,326	1,238	889	587	1,141	9.4%	-2.7%	6.2%
Total	**12,534**	**12,199**	**13,521**	**13,105**	**13,715**	**11,855**	**11,998**	**11,472**	**12,386**	**14,060**	**10,015**	**13,936**	**16,005**	**1.3%**	**4.4%**	**2.1%**
AGR		-2.7%	10.8%	-3.1%	4.7%	-13.6%	1.2%	-4.4%	8.0%	13.5%	-28.8%	39.2%	14.8%			

Landings Shares by Airline													
Airline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Alaska	12.7%	12.1%	10.6%	11.3%	11.7%	14.7%	14.3%	13.2%	14.6%	22.4%	27.5%	23.8%	24.5%
American	25.4%	24.0%	23.3%	24.0%	26.0%	28.0%	29.0%	25.1%	23.7%	22.4%	20.6%	18.5%	15.3%
Southwest											2.5%	16.3%	17.8%
United	44.7%	45.1%	44.2%	42.2%	40.4%	30.8%	28.2%	29.0%	28.8%	27.1%	23.3%	19.6%	20.7%
Delta	6.8%	6.8%	5.8%	6.7%	7.3%	9.1%	9.6%	9.8%	10.4%	9.3%	11.3%	15.0%	9.2%
WestJet	6.0%	6.4%	6.9%	7.4%	7.9%	11.2%	11.3%	12.5%	11.9%	10.1%	5.8%	2.6%	5.4%
Other	4.4%	5.6%	9.2%	8.4%	6.6%	6.2%	7.7%	10.4%	10.7%	8.8%	8.9%	4.2%	7.1%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: *Airport records.*

Table 2-9: Annual Landed Weight by Airline

Landed Weight by Airline (1,000,000 lbs)														CAGR		
Airline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2010-2019	2019-2022	2010-2022
Alaska	205	195	172	191	210	235	246	227	275	368	295	355	371	6.7%	0.3%	5.1%
American	269	237	241	226	278	253	277	266	287	315	215	267	298	1.8%	-1.8%	0.8%
Southwest											33	295	375			
United	225	222	254	242	261	231	251	287	306	337	187	222	304	4.6%	-3.4%	2.5%
Delta	49	39	37	42	63	69	73	72	90	102	103	195	142	8.4%	11.8%	9.3%
WestJet	101	110	129	136	155	187	192	198	211	196	80	52	122	7.6%	-14.6%	1.6%
Other	55	89	176	153	115	102	130	177	199	168	87	73	155	13.1%	-2.7%	8.9%
Total	**905**	**891**	**1,009**	**991**	**1,081**	**1,076**	**1,169**	**1,228**	**1,367**	**1,485**	**1,001**	**1,459**	**1,767**	**5.7%**	**6.0%**	**5.7%**
AGR		-1.5%	13.2%	-1.8%	9.1%	-0.5%	8.6%	5.1%	11.3%	8.6%	-32.6%	45.8%	21.1%			

Landed Weight Shares by Airline													
Airline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Alaska	22.7%	21.8%	17.0%	19.3%	19.4%	21.8%	21.0%	18.5%	20.1%	24.8%	29.5%	24.3%	21.0%
American	29.7%	26.6%	23.9%	22.8%	25.7%	23.5%	23.7%	21.7%	21.0%	21.2%	21.5%	18.3%	16.8%
Southwest											3.3%	20.2%	21.2%
United	24.9%	24.9%	25.2%	24.4%	24.1%	21.4%	21.5%	23.4%	22.4%	22.7%	18.6%	15.2%	17.2%
Delta	5.4%	4.4%	3.7%	4.2%	5.8%	6.4%	6.2%	5.9%	6.6%	6.8%	10.3%	13.4%	8.0%
WestJet	11.2%	12.3%	12.8%	13.7%	14.3%	17.4%	16.5%	16.1%	15.4%	13.2%	8.0%	3.5%	6.9%
Other	6.1%	10.0%	17.4%	15.4%	10.7%	9.4%	11.1%	14.4%	14.5%	11.3%	8.7%	5.0%	8.8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: *Airport records.*

Table 2-10: Annual Average Weight per Landing by Airline

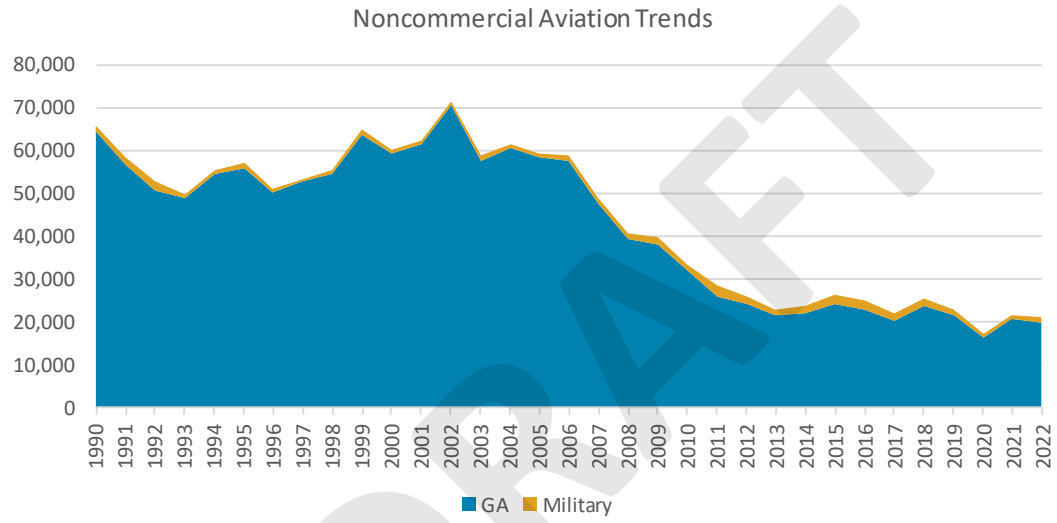
Average Weight per Landing by Airline (Pounds)														CAGR		
Airline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2010-2019	2019-2022	2010-2022
Alaska	128,801	131,242	119,910	128,833	130,514	134,258	143,767	150,257	151,751	116,863	107,272	106,932	94,637	-1.1%	-6.8%	-2.5%
American	84,560	81,189	76,554	71,946	77,931	76,463	79,569	92,521	97,953	99,914	104,242	103,719	121,286	1.9%	6.7%	3.1%
Southwest											128,063	129,483	131,987			
United	40,159	40,392	42,545	43,838	46,982	63,243	74,090	86,293	85,730	88,575	79,834	81,560	91,699	9.2%	1.2%	7.1%
Delta	57,661	47,090	46,825	47,534	63,021	64,157	63,480	64,232	70,033	78,022	91,150	93,262	96,581	3.4%	7.4%	4.4%
WestJet	135,034	139,338	139,500	141,036	142,536	140,683	142,386	137,889	143,590	138,276	138,631	143,209	141,873	0.3%	0.9%	0.4%
Other	100,275	129,809	140,557	139,769	127,000	137,289	140,951	148,240	149,937	135,748	98,228	124,880	135,805	3.4%	0.0%	2.6%
Total Avg.	**72,225**	**73,068**	**74,626**	**75,644**	**78,840**	**90,797**	**97,414**	**107,046**	**110,376**	**105,644**	**99,950**	**104,697**	**110,413**	**4.3%**	**1.5%**	**3.6%**

Source: *Airport records.*

HISTORICAL NONCOMMERCIAL AVIATION ACTIVITY

Noncommercial aviation activity consists of general aviation (GA) and military operations. **Figure 2-15** shows the history of noncommercial aviation trends at PSP, from 1990 to 2022. Overall, noncommercial operations at PSP swung down through the early 1990s, then back up to a peak of 71,782 in 2002. Since then, noncommercial operations almost consistently trended downward. The overall decrease decelerated by 2013 and hovered up and down in the 20,000s through the rest of the decade. After a sharper dip in 2020, noncommercial operations now sit at 21,101 as of 2022. Almost all of PSP's noncommercial trends are made up of GA operations, which have consistently made up more than a 90 percent share compared to military operations.

Figure 2-15: Noncommercial Aircraft Operations



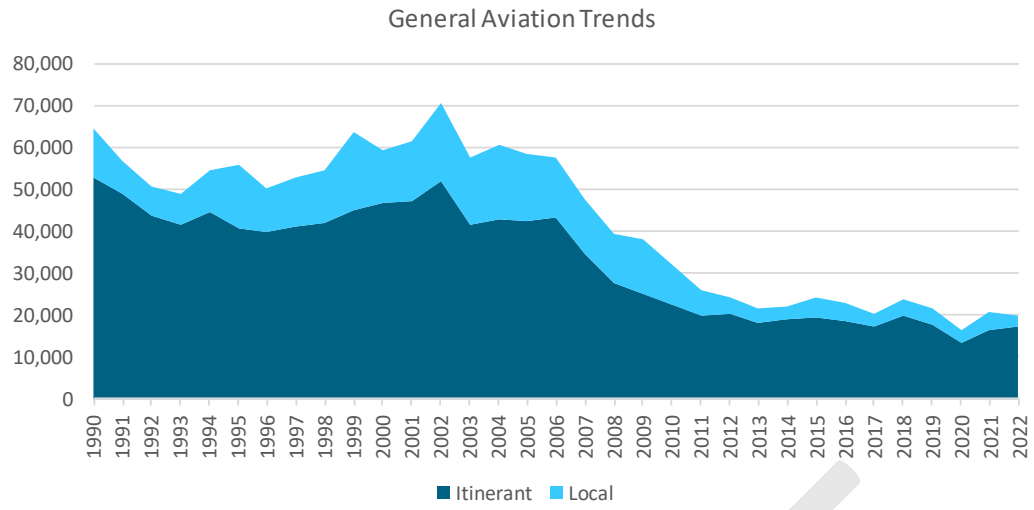
Source: *Federal Aviation Administration Air Traffic Activity System (ATADS).*

Annual General Aviation Trends

PSP's GA activity, comprised of itinerant and local operations, covers noncommercial and non-military passenger or cargo services provided at the Airport. GA activity typically satisfies regional demands for air transport, including private business travel, emergency transport, flight instruction, and recreational flying. It is therefore sensitive to both local and national economic conditions. Itinerant operations are flights going to and coming from a different airport, while local GA operations include flights within the local traffic pattern of the Airport.

Itinerant activity makes up the majority of PSP's general aviation, at least 70 percent of the Airport's GA operations almost annually. Local operations grew during the Great Recession, reaching a peak of 34.2 percent in 2009 (the only year itinerant operations fell below a 70 percent share). Since then, the local share varied but had largely shrunk through the next decade. As of 2022, local operations make up 13.9 percent of PSP's general aviation. **Figure 2-16** shows PSP's annual GA operations.

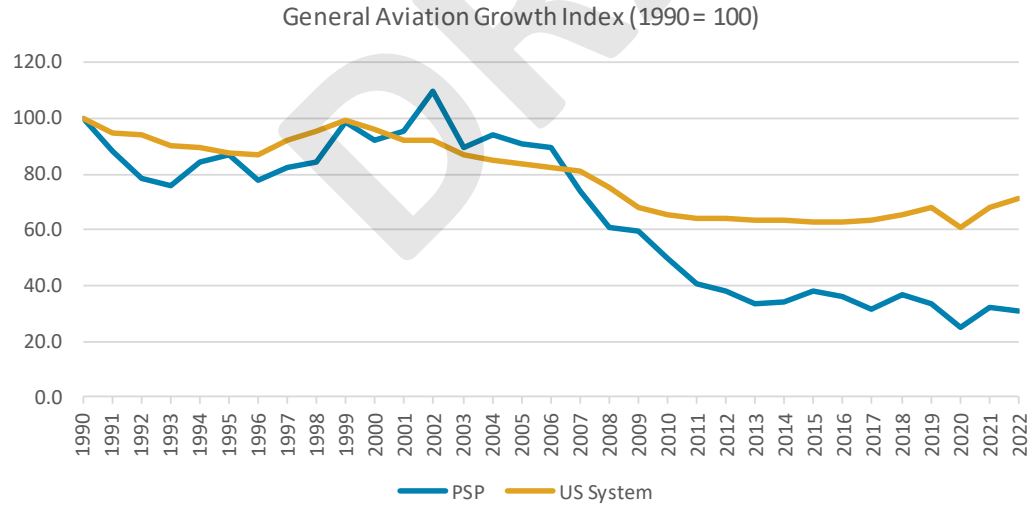
Figure 2-16: Annual GA Operations



Source: *Federal Aviation Administration Air Traffic Activity System (ATADS).*

Throughout their available recorded history, except for a brief period between 2001 and 2006, GA operations growth at PSP has mostly lagged behind that of the U.S. system. Since 2006, the gap between PSP and the U.S. system has widened. As of 2022, PSP's GA operations are currently at 30.9 percent of what they used to be in 1990, while U.S. system GA operations are at 71.1 percent of their 1990 level. **Figure 2-17** compares the annual growth in GA operations for PSP against the national aviation system.

Figure 2-17: PSP vs. U.S. System Annual GA Operations Growth Index (1990 = 100)

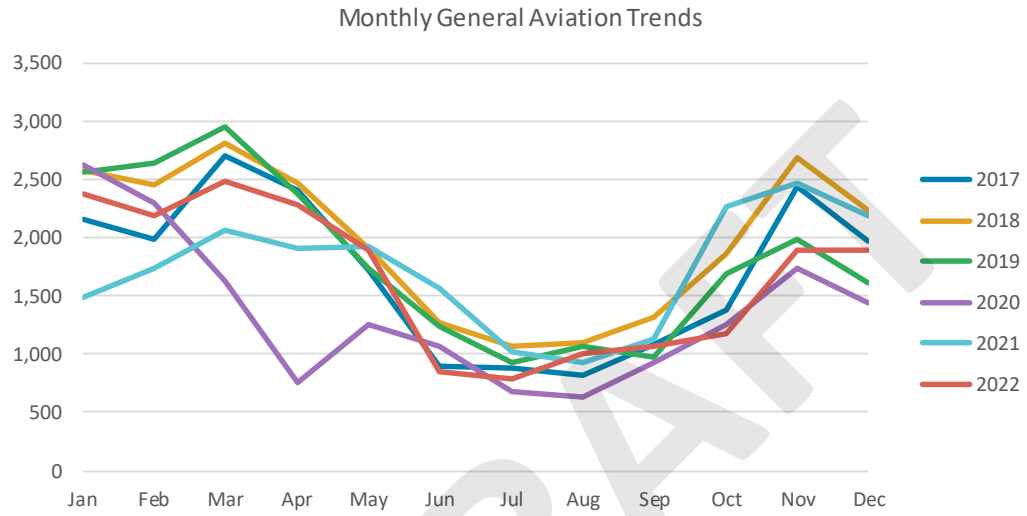


Source: *Federal Aviation Administration Air Traffic Activity System (ATADS).*

Monthly General Aviation Trends

Aside from the initial drop in operations between January and April 2020, the seasonal patterns in PSP's GA trends have mostly remained consistent since 2017. GA activity largely peaks in March, after which operations would swing down to the Airport's least active months in the late summer, followed by another upswing to another peak in November. The March peak is usually higher than the November peak, with the exception of 2021, when operations were still recovering from the pandemic. **Figure 2-18** details PSP's GA operations by month.

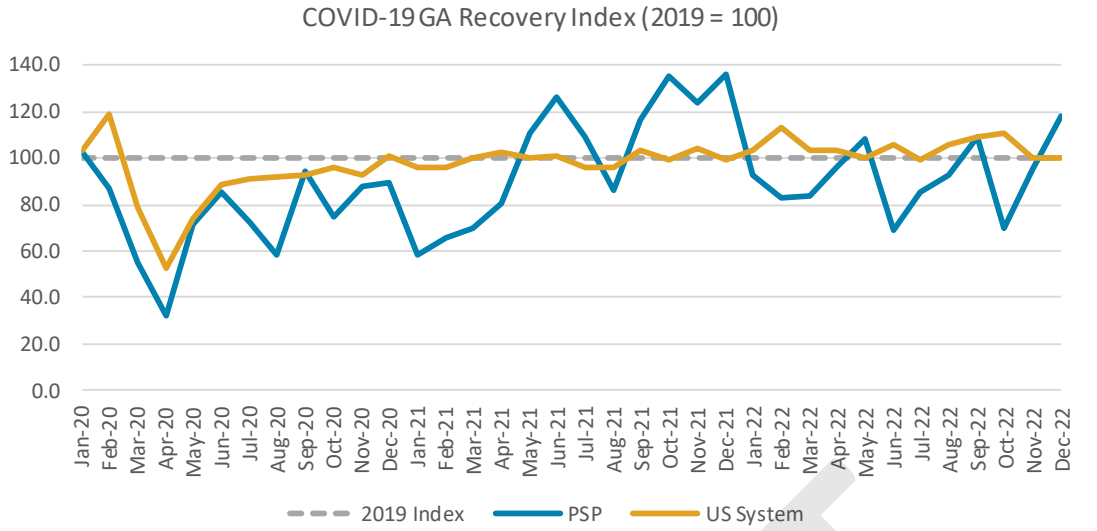
Figure 2-18: Monthly GA Operations



Source: *Federal Aviation Administration Air Traffic Activity System (ATADS).*

As with the rest of the aviation industry, GA activity dropped at PSP and the U.S. system through the beginning months of the COVID-19 pandemic: PSP's GA operations decreased to 32 percent of its 2019 level, while the U.S. system decreased to 53 percent of its 2019 level. Unlike commercial aviation, however, GA activity did not fall as far down nor did it stay down for as long. U.S. system GA operations returned to pre-pandemic levels by December 2020. PSP's GA recovery has been much rockier, first passing pre-pandemic levels in May 2021, but falling back below pre-pandemic levels with periodic spikes through 2022. As of December 2022, PSP's GA operations have again surpassed pre-pandemic numbers at 117.9 percent of its 2019 level, while the U.S. system's GA operations sit at 100.2 percent of its 2019 level. **Figure 2-19** compares PSP's monthly COVID-19 GA recovery index to that of the national aviation system.

Figure 2-19: Monthly PSP vs. U.S. System COVID-19 GA Recovery Index (2019 = 100)

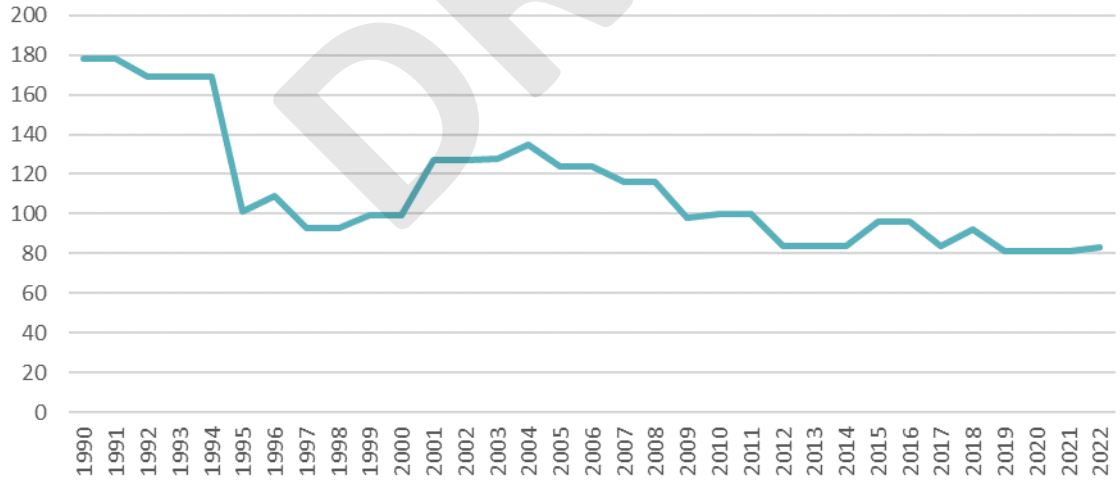


Source: *Federal Aviation Administration Air Traffic Activity System (ATADS).*

Based Aircraft

Figure 2-20 shows the number of aircraft based at PSP, which has fallen by more than 50 percent since 1990. Based on the historical numbers reported in the latest FAA TAF for PSP, the number of based aircraft decreased from 178 in 1990 and 1991 to 81 in 2019-2021, and is estimated to be 183 in 2022.

Figure 2-20: Based Aircraft



Source: *Federal Aviation Administration Terminal Area Forecasts.*

COMMERCIAL PASSENGER TRAFFIC - FORECASTS

This section presents forecasts of enplanements and passenger aircraft operations, along with a discussion of the forecast methodology and results. Forecast development takes into account the pandemic impacts, the ensuing demand and supply changes in the aviation industry, and the changes in the business environment. To achieve this, it employs a hybrid modeling framework that combines multiple forecasting methods and multiple data sources to project air traffic during different phases of recovery and growth. This approach allows the use of different methods and available data to best reflect supply and demand trends during each phase. The forecast horizon is divided into a near-term phase and a long-term phase.

The different forecasting methods employed are summarized below:

- Use of available advance airline schedules, along with an analysis of trends in seat completion rates and boarding load factors—a bottom-up forecasting approach reflecting current and near-term supply changes.
- Analysis of monthly enplanement recovery trends using trendline fitting (univariate time series regression) to capture current air traffic demand growth patterns.
- Multivariate regression analysis to link long-term growth in demand for air travel to fundamental economic drivers such as (1) national economic growth trends indicated by the U.S. real GDP per capita and (2) trends in the price of air travel measured by average passenger yield.
- A top-down forecasting approach to derive projections of aircraft operations from forecast enplanements, where intermediate forecast inputs include fleet mix projections, seats per aircraft operation, and boarding load factors by airline—forecast inputs that reflect supply-side changes.

Forecast scenario development acknowledges the elevated risk and uncertainty in the aviation industry (see **Appendix B**) and the broad economic environment by producing a range of forecasts. Three forecast scenarios are presented: Low, Base, and High scenarios. Among the three scenarios presented, the Base scenario is recommended as the forecast scenario for FAA approval.

The Low and High complete a range of forecast activity levels for planning and sensitivity analyses to anticipate both downside and upside possibilities. In the short run, the differences in enplanement growth are driven by assumptions on boarding load factors and schedule completion rates. In the long run, the differences are driven by differences in key demand drivers, including GDP growth and passenger yields. The future, however, is inherently uncertain. A multitude of factors and events can introduce uncertainty, especially over a long forecast period. Forecast development relies on information available at the time of development; if the outlook changes materially and any of the assumptions fail to hold, actual traffic could fall outside forecast levels presented by the three scenarios.

Hybrid Forecast Development Framework

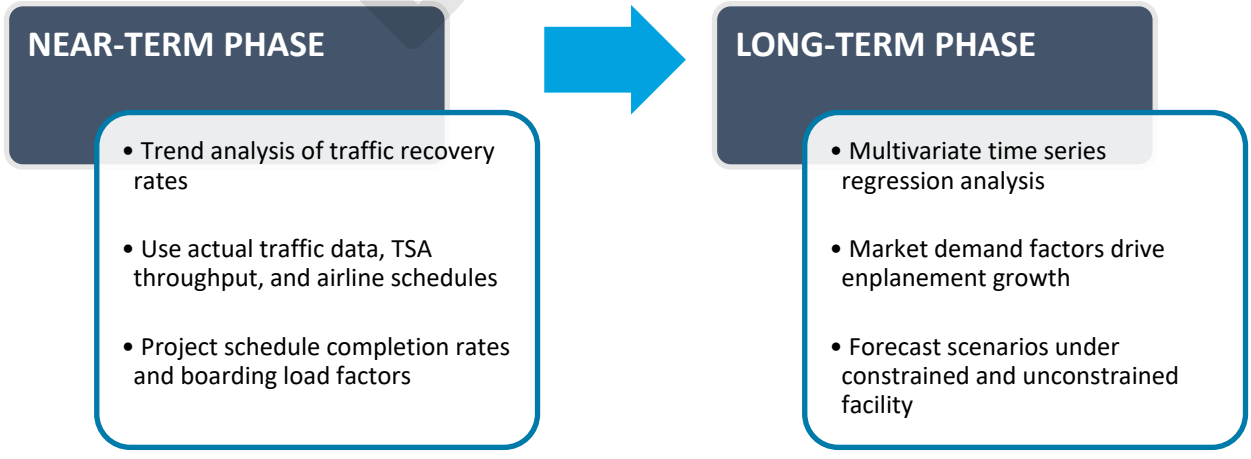
A hybrid modeling framework leverages the strengths of different forecasting methods and data sources in projecting air traffic during different phases of recovery and growth, which is shown in **Figure 2-21**. The forecast period is divided into two phases: a near-term phase and a long-term phase.

In the near-term phase, analysis of traffic recovery trends, published airline schedules, seat completion rates, and boarding load factors produce projections of flights, seats, and enplanements. During this phase, the growth of passenger traffic is projected on a monthly frequency. Once the growth patterns of projected monthly enplanements stabilize, the forecast period enters the long-term phase. In the long-term phase, multivariate regression analysis is used to (1) quantify the relationship between air travel demand and key market drivers and (2) project annual enplanement growth rates based on projected trends in key market drivers.

Forecast development by phase allows us to consider different factors expected to drive traffic trends in the different phases. In the near-term phase, for instance, the enplanement forecasts are based on our assumptions of monthly seat completion rates and boarding load factors. These assumptions are derived from the analysis of high-frequency TSA throughput data and published advance airline schedules. This forecasting approach, in addition to the use of near real-time data, allows the forecasts to reflect the most up-to-date trends in the Airport's air traffic and airlines' capacity.

In the long-run phase, the growth patterns of the Airport's passenger traffic are assumed to have stabilized. This "normalization" indicates a new equilibrium in the relationship between air travel demand and air travel supply. Market demand factors, such as income and price, along with any lasting changes in personal and business travel propensity and preferences, will again become the primary driver of growth in passenger demand for air travel. Forecasting in this phase is done on a quarterly frequency.

Figure 2-21: Forecast Development by Phase



Near-Term Phase

In this phase, forecast development considers the recent progress in traffic recovery and growth. To reflect the most recent air traffic trends at the Airport, the analysis is based on near real-time traffic data at the time of forecast development (April 2023). Data on actual airport activity (enplanements, departures, and landed weight) was available through January 2023. The TSA screening throughput data was available through April 2023, reflecting PSP's actual passenger traffic patterns in real time. Data on airlines' seat capacity is based on advance airline schedules accessed in April 2023.

Airline schedules, supplemented with TSA throughput screening data, provide the starting point for projecting monthly flights, seats, and enplanements by airline from February to September 2023. Specifically, the enplanements are estimated using advance airline schedules, adjusted for expected schedule completion rates as shown in **Table 2-11**, and projected boarding load factors as shown in **Table 2-12**.

Table 2-11: Projected Schedule Completion Rates and Seats

Month	Schedule Completion Rate			Projected Seats		
	Base	Low	High	Base	Low	High
Feb-23	100%	100%	100%	247,939	247,939	247,939
Mar-23	100%	100%	100%	276,732	276,732	276,732
Apr-23	100%	100%	100%	252,603	252,603	252,603
May-23	100%	97%	100%	163,152	158,257	163,152
Jun-23	100%	97%	100%	85,194	82,638	85,194
Jul-23	99%	96%	100%	80,528	78,087	81,341
Aug-23	96%	93%	99%	77,232	74,819	79,646

Source: *Unison Consulting, Inc.*

Schedule completion rates are projected to decrease below 100 percent to anticipate cuts in airline schedules. The sub-100 percent schedule completion rate assumptions consider both airlines' practice of adjusting advance schedules—mostly downward—as flight dates get closer and external factors constraining airline capacity. Low and high projections of the rates anticipate different degrees by which supply-side issues—for example, pilot shortage, tight labor supply, inflation, and fleet constraints—could constrain airline capacity. Based on advance schedules published in April 2023, airlines are expected to complete at least 93 percent of their schedules through August 2023.

Table 2-12: Projected Boarding Load Factors

Actual Boarding Load Factors[1]				Projected Boarding Load Factors[3]			
Month	2019	2022	Difference (pp)[2]	Month	Base	Low	High
Jan	68.53%	58.72%	-9.81	Jan-23	67.62%	67.62%	67.62%
Feb	75.37%	74.97%	-0.41	Feb-23	74.58%	74.58%	74.58%
Mar	83.95%	83.72%	-0.24	Mar-23	85.12%	85.12%	85.12%
Apr	79.42%	82.46%	3.05	Apr-23	79.30%	77.28%	81.36%
May	84.53%	83.66%	-0.86	May-23	84.69%	82.69%	86.69%
Jun	86.18%	76.18%	-10.00	Jun-23	85.38%	83.38%	87.38%
Jul	85.50%	71.35%	-14.15	Jul-23	83.93%	81.93%	85.93%
Aug	82.52%	68.11%	-14.42	Aug-23	80.43%	78.43%	82.43%
Sep	84.01%	74.09%	-9.92	Sep-23	85.49%	83.44%	87.58%
Oct	79.16%	79.11%	-0.05	Oct-23	80.61%	78.57%	82.64%
Nov	77.21%	77.74%	0.53	Nov-23	79.63%	77.67%	81.60%
Dec	73.44%	68.10%	-5.35	Dec-23	75.14%	73.14%	77.18%

Source: *Unison Consulting, Inc.*

Notes: *[1] Boarding load factors (BLF) = enplanements divided by available seats.*

[2] The column reports the percentage-point difference between 2019 and 2022 monthly boarding load factors. Negative values indicate lower 2022 levels, relative to the 2019 levels for the same months.

[3] BLF projections begin in March 2023.

The boarding load factor assumptions reflect seasonal patterns as well as an overall improving trend. In 2022, monthly average boarding load factors were near or above 2019 levels around half of the months.[4] On average, monthly boarding load factors in 2022 were 5.1 percent points lower than 2019 levels, up from being 14 percentage points lower in 2021. Following these trends, the Base scenario assumes an improvement in monthly boarding load factors, nearing or exceeding 2019 levels from March 2023 through August 2023. By contrast, the Low scenario assumes that monthly boarding load factors remain around 2 percentage points lower than the 2019 levels over the same period. The High scenario assumes boarding load factors are around 2 percentage points higher than the 2019 levels.

Between September and December 2023, forecast development employs trend analysis to project enplanements for the remaining months of 2023. A trendline is fitted on monthly enplanements from April 2020, when they fell to their lowest level during the pandemic, to August 2023. We also fit a truncated trendline, which begins in June 2021 when monthly enplanements first exceeded 2019 levels. Both linear and logarithmic functional forms are evaluated to represent the Airport's air traffic trajectory. The linear function projects a steeper, straight-line growth trajectory. The logarithmic function projects an initial acceleration of growth and eventual tapering. The truncated logarithmic functional form is

[4] The exceptions were January, June, July, August, September, and December.

ultimately chosen, considering limiting factors on both the demand side (inflation and slowing economy) and the supply side (pilot shortage, staffing constraints due to tight labor supply, supply chain issues, and inflation).

In the Base scenario, monthly enplanements between September and December 2023 are assumed to hold steady at around 129 percent of 2019 levels, slightly above the January-August 2023 average (125.5 percent of 2019 levels). In the Low scenario, monthly enplanements are assumed to be 122 percent of 2019 levels through the remainder of 2023. In the High scenario, monthly enplanements are assumed to be 137 percent of 2019 levels through the remainder of 2023.

Long-Term Phase

Beyond 2023 marks the end of the near-term phase and the start of the long-term phase. In this phase, growth in passenger traffic is expected to be driven by the economics of air travel demand, assuming air travel supply would adjust to accommodate changes in demand. The effects of macroeconomic factors, air fare, and the residual impacts of the COVID-19 pandemic are accounted for via the projected trends in market demand drivers, which are sourced from independent forecasts by Moody's Analytics.

Multivariate time series regression analysis is used to link enplanement growth to changes in key market demand drivers. In particular, multivariate time series regression analysis provides a quantitative framework for measuring the contributions of key demand drivers to passenger traffic, while accounting for structural changes, time-dependent trends, and serial correlation often found in time series data. Model estimation uses quarterly data from 1993Q1 through 2019Q4 to measure the historical relationships between enplanements and demand drivers.

Based on the economic theory of consumer demand, the main determinants of demand for air travel are trends in income and price of air travel. Income growth is driven by overall economic growth. Trends in the price of air travel reflects the effects of supply-side factors such as competition, input costs, and profit targets, and any constraints on capacity, among others. They also reflect any imbalances in air travel demand and supply.

The regression model uses U.S. real GDP per capita as the economic indicator to measure income growth trends and the Airport's average real passenger yield as the price variable. The average passenger yield—calculated as the average fare per mile traveled—serves as a better measure of the price of air travel because it controls for trip distance. The historical and forecast trends in these variables are shown in **Figure 2-22**. U.S. real GDP per capita is expected to continue its (linear) upward trend, ending the forecast period 66 percent above the 2012 level. PSP's average real passenger yield is expected to resume its downward trend, which was briefly interrupted by the pandemic, and end the forecast period at around 89 percent of the 2012 level.

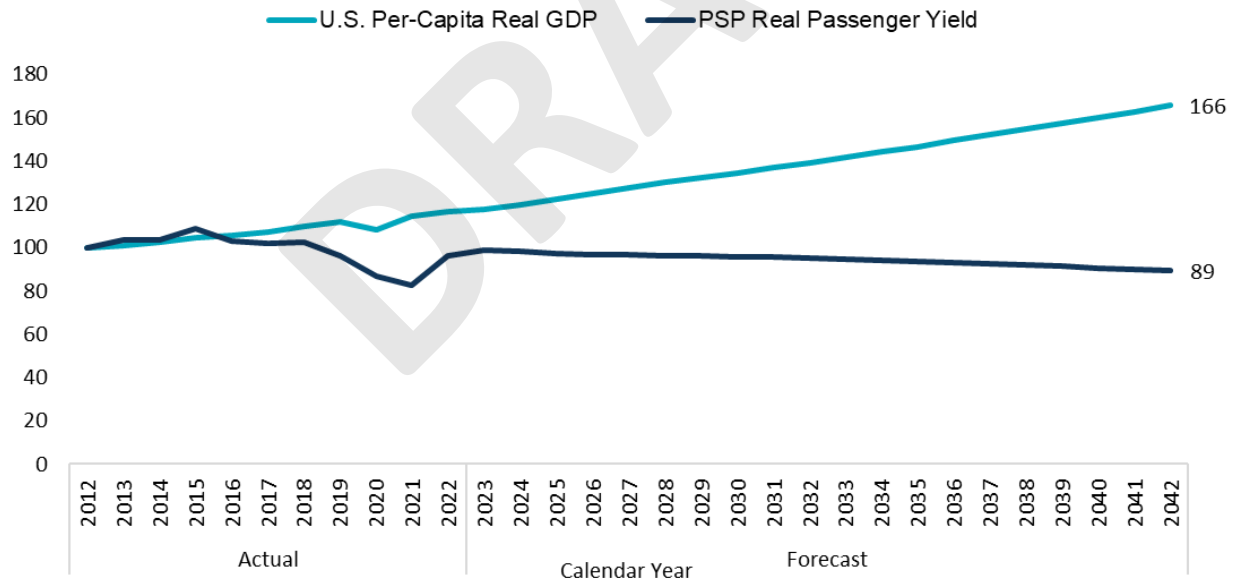
The model also controls for structural changes over the estimation period, such as the 9/11 terrorist attacks in 2001, quarterly enplanement patterns, and autoregressive and moving average terms

commonly used to address serial correlation in time series data. We also tested other variables, including U.S. unemployment rate, U.S. nonfarm employment, U.S. population, and MSA income per capita. These variables were ultimately omitted from the model as they failed to provide a better fit.

Forecasting using regression analysis is done in two steps. The first step is model estimation and the second step is using the estimated model for prediction. Model estimation uses historical data to estimate regression coefficients for the explanatory variables discussed above. Regression coefficients measure the contribution of each explanatory variable to the dependent variable (quarterly enplanements). The result is a regression equation that is then used to calculate future values of the dependent variable given projected values for the explanatory variables.

The estimated regression equation meets statistical evaluation criteria for determining its suitability for forecasting. The regression equation yields statistically significant regression coefficients in the demand drivers and control variables. Importantly, all of the signs of the regression coefficients confirm their expected contributions to air travel demand: positive for the income variable and negative for the price variable and control for variable for the impact of the 9/11 terrorist attacks. The estimated regression equation also produces a high adjusted R-squared statistic—a value greater than 0.98—whereby an R-squared statistic of 1 indicates a perfect fit.[5]

Figure 2-22: Growth of Key Market Demand Drivers (2012 Level = 100)



Sources: *Unison Consulting, Inc., and Federal Aviation Administration.*

Notes: *Moody's Analytics for the forecasts of U.S. real GDP per capita and Consumer Price Index (CPI), and 2023-2043 FAA Aerospace Forecasts for PSP's nominal passenger yield. Conversion of nominal passenger yield to real passenger yield is based on Moody's forecast of CPI.*

[5] The regression model with only the price variable, the income variable, the 9/11 indicator variable, and the quarterly indicator variable, already captures a high degree of variation in PSP's enplanement trends, yielding an adjusted R-squared of 0.9.

Commercial Passenger Traffic Forecast

Three forecast scenarios of annual commercial passenger enplanements from 2023 to 2042 are presented in this section. **Table 2-13** presents the forecast annual enplanements at five-year intervals over the forecast period, starting at 2027 and ending in 2042, and compare them with FAA's 2022 Terminal Area Forecasts (February 2023 publication). The corresponding forecast annual enplanements are detailed in **Figure 2-23**.

In all three scenarios, annual enplanements are expected to demonstrate robust growth over the forecast horizon. Scenario 2 (Base) is the recommended scenario and serves as the base scenario on which other scenarios are developed. Under the preferred Scenario 2 (Base), annual enplanements grow to 2.19 million enplanements by 2032 (70.0 percent above the 2019 level) and 2.88 million enplanements by 2042 (around 123.0 percent above the 2019 level). The 2022-2032 compounded annual growth rate is projected to be 3.84 percent, and the 2032-2042 compounded annual growth rate is projected to be 2.77 percent.

Compared to Scenario 2, Scenario 1 presents lower forecast enplanement levels and slower pace of growth. Scenario 1 reflects a conservative outlook to anticipate downside risk factors, including a near-term recession in 2024, upward inflationary pressures, and dampened long-term economic growth. Under Scenario 1 (Low), annual enplanements grow to 2.01 million enplanements by 2032 (56.0 percent above the 2019 level) and 2.54 million enplanements by 2042 (97.5 percent above the 2019 level). The 2022-2032 compounded annual growth rate is 2.96 percent, and the 2032-2042 compounded annual growth rate is projected to be 2.39 percent.

Scenario 3 (High) presents the forecast associated with an optimistic economic outlook, including faster economic growth and lower inflationary pressures resulting in faster declines in real passenger yields. It also considers the expert input from Air Service Development consultants and the Airport regarding PSP's air service development initiatives and objectives. The initiatives include the conversion of current seasonal service into year-round service, the addition of new seasonal and year-round service, and the introduction of long-haul international flights to Europe. Annual enplanements are projected to be around 2.36 million in 2032 (82.9 percent above the 2019 level) and 3.22 million in 2042 (149.7 percent above the 2019 level). The 2022-2032 compounded annual growth rate is 4.61 percent, and the 2032-2042 compounded annual growth rate is projected to be 3.16 percent.

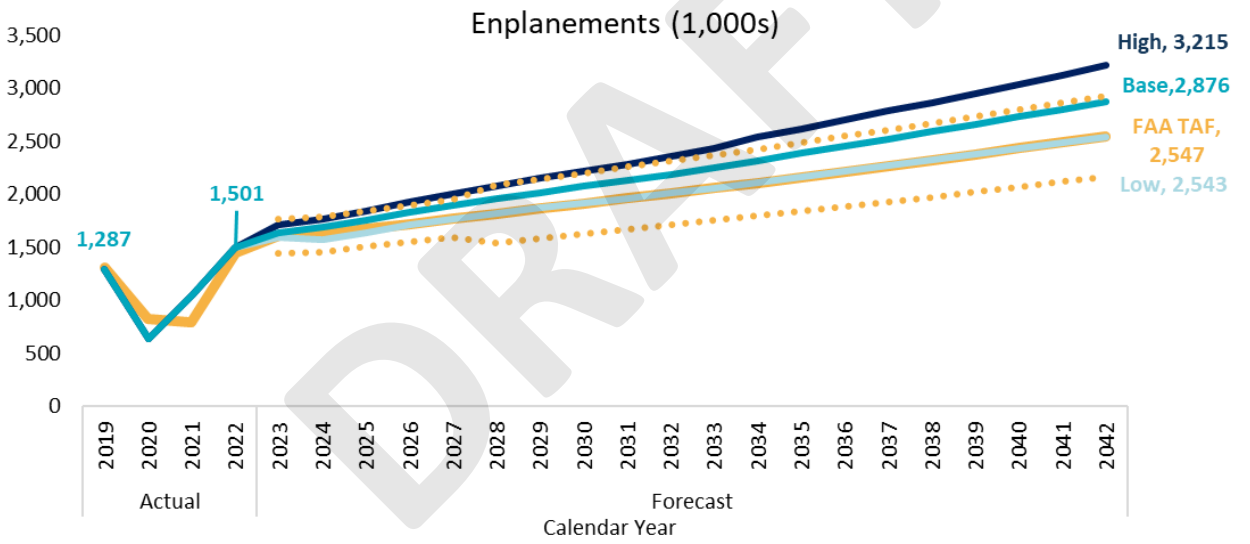
Table 2-13: Forecast Annual Commercial Enplanements by Calendar Year

	Actual				Forecast				Compound Annual Growth Rate			Percent of 2019 Level	
	2019	2020	2021	2022	2027	2032	2037	2042	2019-2022	2022-2032	2032-2042	2032	2042
Enplanements (1,000)													
Scenario 1 (Low)	1,287	632	1,048	1,501	1,768	2,009	2,269	2,543	5.24%	2.96%	2.39%	156.0%	197.5%
Scenario 2 (Base)	1,287	632	1,048	1,501	1,891	2,188	2,522	2,876	5.24%	3.84%	2.77%	170.0%	223.4%
Scenario 3 (High)	1,287	632	1,048	1,501	2,001	2,355	2,784	3,215	5.24%	4.61%	3.16%	182.9%	249.7%
FAA TAF	1,311	825	793	1,447	1,767	2,011	2,267	2,547	3.36%	3.34%	2.39%	153.4%	194.3%
Percent of FAA TAF													
Scenario 1 (Low)	98.2%	76.7%	132.2%	103.7%	100.1%	99.9%	100.1%	99.8%					
Scenario 2 (Base)	98.2%	76.7%	132.2%	103.7%	107.0%	108.8%	111.2%	112.9%					
Scenario 3 (High)	98.2%	76.7%	132.2%	103.7%	113.3%	117.1%	122.8%	126.2%					

Sources: *Historical data from Airport records, forecasts by Unison Consulting, Inc., and Federal Aviation Administration Terminal Area Forecasts as of February 2023.*

Note: *Terminal Area Forecasts data is on federal fiscal year ending in September.*

Figure 2-23: Forecast Annual Commercial Enplanements by Calendar Year



Sources: *Historical data from Airport records, forecasts by Unison Consulting, Inc., and Federal Aviation Administration Terminal Area Forecasts as of February 2023.*

Notes: *Terminal Area Forecasts data is on federal fiscal year ending in September. Dashed lines indicate the range in which the FAA consider the forecasts to be consistent with the 2022 Terminal Area Forecast for PSP.*

Table 2-14 presents a summary of the forecast commercial aircraft operations (departures and arrivals) at five-year intervals over the forecast period, starting in 2027 and ending in 2042. The corresponding forecast trends for annual commercial passenger aircraft operations are presented in **Figure 2-24**. Over the long run, aircraft operations, generally, grow at a slower pace than enplanements due to the increases in average seats per flight and improvements in boarding load factors.

Scenario 1 (Low) projects annual aircraft operations will eventually reach 48,779 operations in 2042 (67.6 percent above the 2019 level). The 2019-2022 compounded annual growth rate was 3.76 percent, the 2022-2032 compounded annual growth rate is projected to be 2.05 percent, and the 2032-2042 compounded annual growth rate is projected to be 2.27 percent.

Scenario 2 (Base) projects annual aircraft operations will eventually reach 54,305 operations in 2042 (86.6 percent above the 2019 level). The 2022-2032 compounded annual growth rate is projected to be 2.60 percent, and the 2032-2042 compounded annual growth rate is projected to be 2.75 percent.

Scenario 3 (High) projects annual aircraft operations will eventually reach 59,014 operations in 2042 (102.8 percent above the 2019 level). The 2022-2032 compounded annual growth rate is projected to be 3.03 percent, and the 2032-2042 compounded annual growth rate is projected to be 3.12 percent.

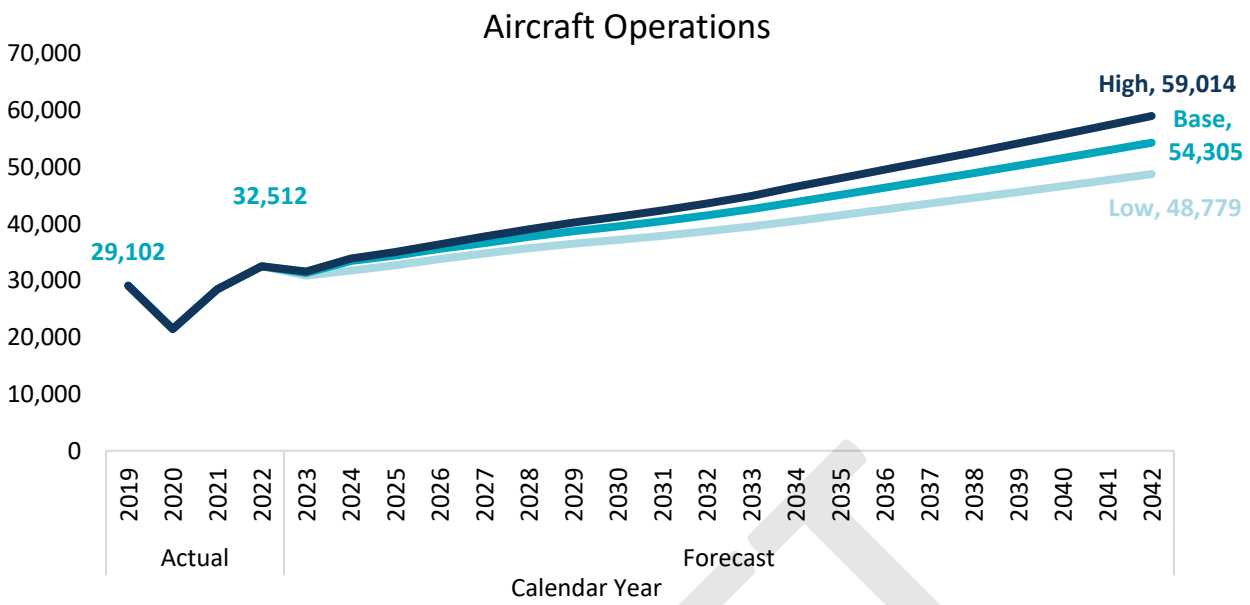
Table 2-14: Forecast Annual Commercial Passenger Aircraft Operations by Calendar Year

	Actual				Forecast				Compound Annual Growth Rate			Percent of 2019 Level	
	2019	2020	2021	2022	2027	2032	2037	2042	2019-2022	2022-2032	2032-2042	2032	2042
Aircraft Operations													
Scenario 1 (Low)	29,102	21,458	28,462	32,512	34,781	38,693	43,578	48,779	3.76%	2.05%	2.27%	133.0%	167.6%
Scenario 2 (Base)	29,102	21,458	28,462	32,512	36,618	41,483	47,665	54,305	3.76%	2.60%	2.75%	142.5%	186.6%
Scnario 3 (High)	29,102	21,458	28,462	32,512	37,760	43,587	51,072	59,014	3.76%	3.03%	3.12%	149.8%	202.8%
Percent of Scenario 2 (Base)													
Scenario 1 (Low)	100.0%	100.0%	100.0%	100.0%	95.0%	93.3%	91.4%	89.8%					
Scenario 3 (High)	100.0%	100.0%	100.0%	100.0%	103.1%	105.1%	107.1%	108.7%					

Sources: *Historical data from Airport record, OAG schedules, and forecasts by Unison Consulting, Inc.*

Notes: *Historical data are based on OAG schedules and do not include nonscheduled operations. They could overestimate the actual aircraft operations in 2020 due to elevated flight cancellations during the COVID-19 pandemic.*

Figure 2-24: Forecast Annual Commercial Passenger Aircraft Operations by Calendar Year



Sources: *Historical data from Airport records, OAG schedules, and forecasts by Unison Consulting, Inc.*

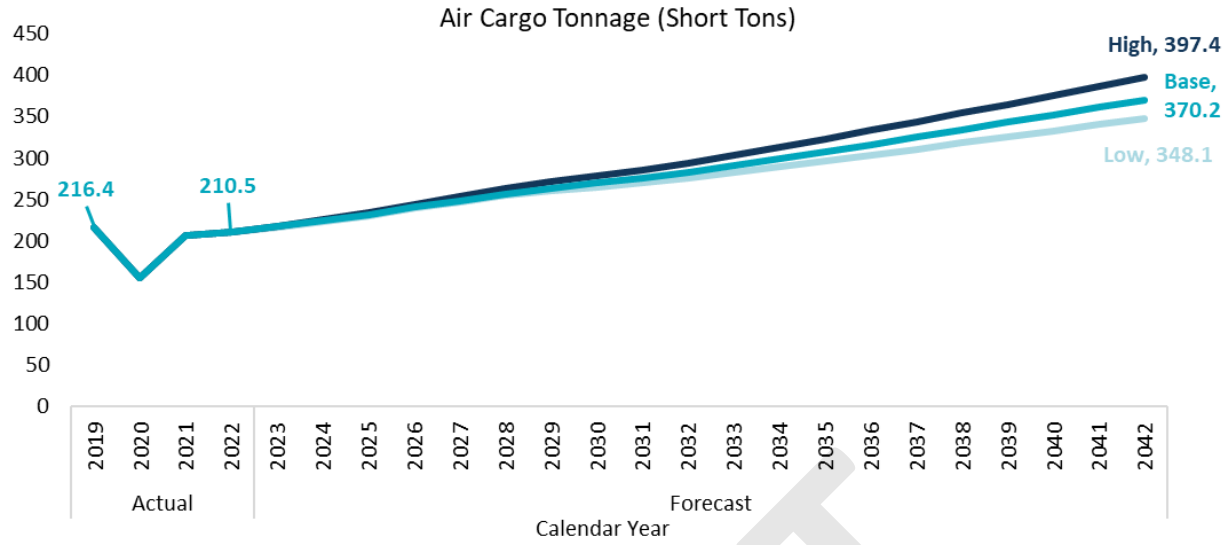
With the increase in aircraft operations, air cargo is expected to rise at PSP. As PSP's air cargo is comprised mostly of belly cargo from Alaska Airlines, we assume PSP's air cargo grows with the number of Alaska's aircraft operations at the Airport. By 2042, air cargo at PSP is expected to grow to 348.1 short tons in the Low scenario (60.8 percent above the 2019 level), 370.2 short tons in the Base scenario (71.1 percent above the 2019 level), and 397.4 short tons (83.6 percent above the 2019 level).

Table 2-15: Forecast Annual Commercial Passenger Aircraft Cargo (Short Tons) by Calendar Year

	Actual				Forecast				Compound Annual Growth Rate			Percent of 2019 Level	
	2019	2020	2021	2022	2027	2032	2037	2042	2019-2022	2022-2032	2032-2042	2032	2042
Cargo Tonnage (Short Tons)													
Scenario 1 (Low)	216.4	154.9	205.9	210.5	246.9	275.9	310.9	348.1	-0.91%	2.74%	2.35%	127.5%	160.8%
Scenario 2 (Base)	216.4	154.9	205.9	210.5	248.4	282.7	324.9	370.2	-0.91%	2.99%	2.74%	130.6%	171.1%
Scenario 3 (High)	216.4	154.9	205.9	210.5	253.2	293.9	343.5	397.4	-0.91%	3.39%	3.06%	135.8%	183.6%
Percent of Base Scenario													
Scenario 1 (Low)	100.0%	100.0%	100.0%	100.0%	99.4%	97.6%	95.7%	94.0%					
Scenario 3 (High)	100.0%	100.0%	100.0%	100.0%	102.0%	104.0%	105.7%	107.3%					

Sources: *Historical data from Airport records, OAG schedule, and forecasts by Unison Consulting, Inc.*

Figure 2-25: Forecast Annual Commercial Passenger Aircraft Cargo (Short Tons) by Calendar Year

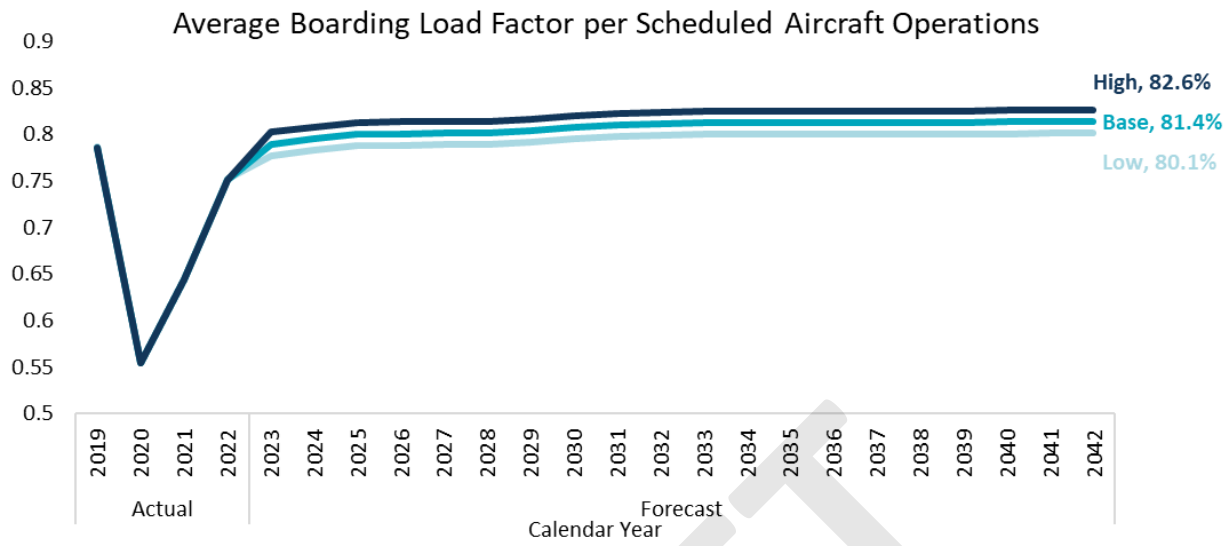


Sources: *Historical data from Airport records, OAG schedules, and forecasts by Unison Consulting, Inc.*

Projections of aircraft operations are derived from forecast enplanements, along with projections of aircraft fleet mix, seats per aircraft operation, and boarding load factors at the airline level. Specifically, forecast enplanements and average boarding load factor determine the number of seats needed to accommodate forecast enplanements. The forecast number of seats and seats per aircraft operation determine the number of aircraft operations. The projected trends in boarding load factors follow the projected industry trends for the 2023-2043 FAA Aerospace Forecasts, rising slightly throughout the forecast horizon. Projections of the average number of seats per aircraft operation are derived from the projections of airlines' fleet composition.

As airlines recover from the pandemic and restore flight operations, boarding load factors, which fell sharply during the pandemic, are projected to return to pre-COVID levels and continue to increase at diminishing rates thereafter. Over the long run, the average boarding load factor per aircraft operation is expected to rise above the 2019 level of 78.6 percent. It is expected to converge to 80.1 percent in Scenario 1 (Low), 81.4 percent in Scenario 2 (Base), and 82.6 percent in Scenario 3 (High). **Figure 2-26** presents the trends in average boarding load factor per scheduled aircraft operation.

Figure 2-26: Scheduled Commercial Passenger Service Average Boarding Load Factor per Aircraft Operation



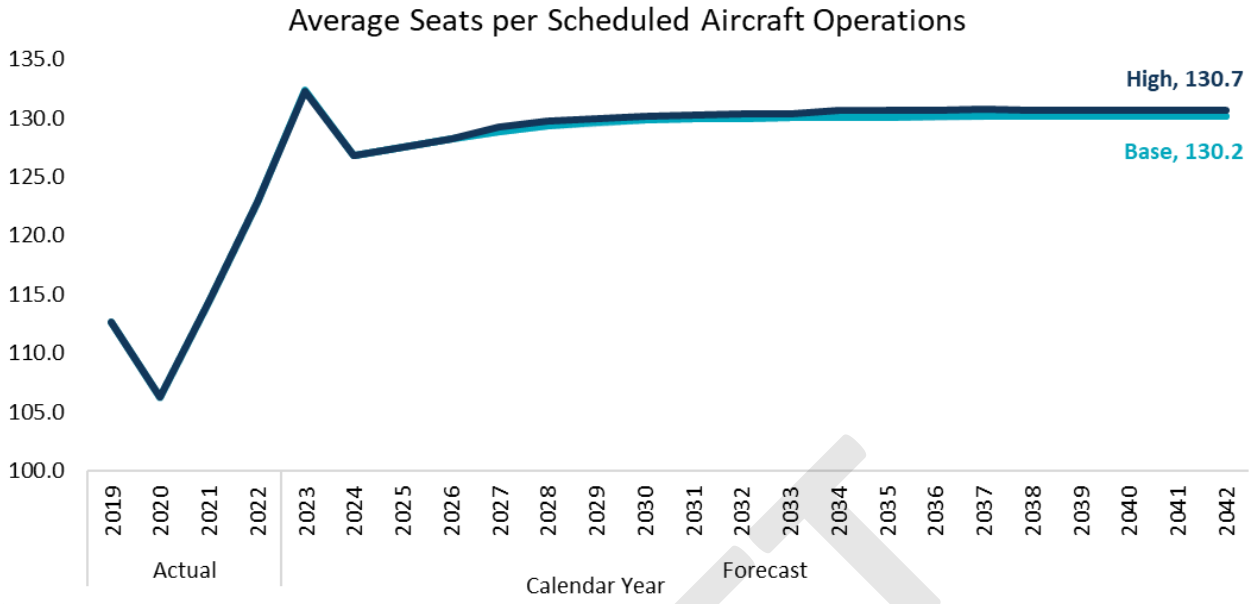
Sources: *Historical data from Airport records, OAG schedules, and forecasts by Unison Consulting, Inc.*

The number of seats per aircraft operation is also projected to increase over time as airlines renew their depreciated fleets with larger aircraft—a process known as fleet up-gauging.[6] The pandemic has accelerated fleet up-gauging as airlines retired older aircraft and replaced them with newer aircraft models that are not only more fuel efficient but also with higher seat capacity. These industry-level changes are reflected in the forecast fleet composition at PSP.

Average seat capacity per operation is similar between the Base and Low scenarios and is projected to increase gradually from 126.8 in 2024 to 130.2 in 2042. Under the High scenario, the average seat capacity is expected to be higher with the introduction of widebody jets, rising to 130.7 by the end of 2042. **Figure 2-27** presents the trends in average seats per scheduled aircraft operations.

[6] Fleet up-gauging was a common strategy among airlines following the Great Recession as a way to reduce maintenance cost and increase operation efficiency.

Figure 2-27: Scheduled Commercial Passenger Service Average Seats per Aircraft Operation



Sources: *Historical data from Airport records, OAG schedules, and forecasts by Unison Consulting, Inc.*

Note: *The figure does not include data from the Low scenario, which is similar to the Base scenario and converges to 130.1 average seats per scheduled aircraft operations by 2042.*

Table 2-16 summarizes the composition of scheduled commercial passenger operations by equipment group. In 2022, the two primary equipment groups at the Airport were narrowbody jets (18,774 operations and 57.7 percent of total operations) and regional jets (13,738 operations and 42.3 percent of total operations). In all three scenarios, the share of operations performed by narrowbody jets is expected to grow to around 62 percent by the end of 2042, with the share of operations performed by regional jets fall to around 38 percent. In the High scenario, the share of operations performed by widebody jet is expected to be around 0.4-0.7 percent beginning in 2027.

Table 2-16: Scheduled Commercial Passenger Operations by Equipment Group

	Actual				Scenario 1 (Low)				Scenario 2 (Base)				Scenario 3 (High)			
	2019	2020	2021	2022	2027	2032	2037	2042	2027	2032	2037	2042	2027	2032	2037	2042
Passenger Airline Fleet Composition																
Narrowbody Jet	14,938	9,754	14,300	18,774	21,508	23,928	26,955	30,177	22,641	25,650	29,480	33,591	23,221	26,823	31,347	36,261
Regional Jet	14,164	11,192	13,988	13,738	13,273	14,765	16,623	18,602	13,977	15,833	18,185	20,714	14,365	16,591	19,378	22,406
Turboprop Jet	0	512	174	0	0	0	0	0	0	0	0	0	0	0	0	0
Widebody Jet	0	0	0	0	0	0	0	0	0	0	0	0	173	173	347	347
Total	**29,102**	**21,458**	**28,462**	**32,512**	**34,781**	**38,693**	**43,578**	**48,779**	**36,618**	**41,483**	**47,665**	**54,305**	**37,760**	**43,587**	**51,072**	**59,014**
Percentage of Total Aircraft Operations																
Narrowbody Jet	51.3%	45.5%	50.2%	57.7%	61.8%	61.8%	61.9%	61.9%	61.8%	61.8%	61.8%	61.9%	61.5%	61.5%	61.4%	61.4%
Regional Jet	48.7%	52.2%	49.1%	42.3%	38.2%	38.2%	38.1%	38.1%	38.2%	38.2%	38.2%	38.1%	38.0%	38.1%	37.9%	38.0%
Turboprop Jet	0.0%	2.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Widebody Jet	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.4%	0.7%	0.6%

Sources: *Historical data from Airport records, OAG schedules, and forecasts by Unison Consulting, Inc.*

Table 2-17 decomposes further the projected distribution of commercial passenger aircraft operations by aircraft type (fleet mix). Fleet mix projections are developed at the airline level and are aggregated here for ease of interpretation. They determine the annual average number of seats per aircraft operation, one of the measures that link forecast enplanements to forecast aircraft operations.

Fleet mix projections reflect recent and planned changes in individual airline fleets. Aircraft retirement and replacement consider the composition of each airline's fleet, expected new aircraft deliveries, planned new purchases, average age of specific aircraft types, and the assumption of a 25-year depreciation period. Retired aircraft are replaced by newer aircraft closest in seat capacity (gauge). For instance, A320neo, A321neo, and B737 MAX are expected to gradually replace the aging A320, A321, and B737 fleets, respectively.[7] Regardless of age, aircraft models expected to remain in production over the forecast horizon are retained, assuming they will be replaced by future deliveries of the same model.

When fully depreciated aircraft have no same-model replacements, they are replaced with newer models closest in seat capacity. For instance, 50-seat regional jets are replaced with 76-seat regional jets. In these instances, the forecast assumes that airlines up-gauge, raising the annual average number of seats per aircraft operation, and thus reducing the number of projected annual operations.

Table 2-20 presents estimates of commercial passenger aircraft operations (arrivals and departures) during the peak month (March), the peak month average day (PMAD), and the PMAD peak hour.

[7] Excepted replacement aircraft and timeframes are based on analysis of annual reports by airlines and aircraft manufacturers.

Table 2-17: Scheduled Commercial Passenger Operations by Airline Fleet Composition

		Actual				Scenario 1 (Low)				Scenario 2 (Base)				Scenario 3 (High)			
Domestic / Internat	Specific Aircraft Name	2019	2020	2021	2022	2027	2032	2037	2042	2027	2032	2037	2042	2027	2032	2037	2042
Domestic	Airbus A220-100	0	0	190	316	354	394	443	494	372	422	483	549	381	441	513	592
	Airbus A220-300	0	0	0	0	154	174	195	218	161	186	213	242	165	194	226	261
	Airbus A318/319/320/321	42	18	26	2	1	2	2	2	2	2	2	2	2	2	2	2
	Airbus A319	1,862	1,974	1,714	1,242	285	316	355	398	298	337	387	441	305	352	411	475
	Airbus A320	3,388	1,272	868	1,670	231	126	142	159	243	137	157	179	253	149	174	201
	Airbus A320neo	0	0	0	0	435	483	543	608	459	519	596	679	473	545	636	736
	Airbus A321	406	50	338	918	679	377	0	0	717	405	0	0	738	425	0	0
	Airbus A321-200neo	0	0	0	0	402	730	988	1,254	420	776	1,074	1,387	430	809	1,138	1,493
	Airbus A321neo	2,358	1,232	1,934	1,602	1,458	1,992	2,668	2,987	1,536	2,137	2,921	3,329	1,578	2,240	3,113	3,602
	Boeing 717-200	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Boeing 737-700	286	592	4,212	4,776	3,093	421	462	517	3,256	448	501	571	3,327	465	529	612
	Boeing 737-800	1,502	1,376	1,036	2,712	2,813	1,680	854	602	2,961	1,797	927	663	3,034	1,875	980	710
	Boeing 737-900	1,524	1,650	3,082	2,726	1,642	1,179	590	0	1,730	1,264	645	0	1,778	1,326	688	0
	Boeing 737MAX 7	0	0	0	0	3,332	6,726	7,582	8,490	3,511	7,218	8,302	9,462	3,589	7,524	8,799	10,180
	Boeing 737MAX 8	0	0	60	104	1,766	3,425	4,896	5,836	1,861	3,677	5,362	6,506	1,910	3,848	5,706	7,026
	Boeing 737MAX 9	0	0	0	174	1,434	2,162	3,019	3,890	1,511	2,320	3,305	4,336	1,554	2,433	3,525	4,695
	Boeing 757	0	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Canadair Regional Jet	3,302	1,974	1,990	1,788	281	0	0	0	295	0	0	0	303	0	0	0
	Canadair Regional Jet 700	2,844	2,412	3,222	2,536	1,012	0	0	0	1,066	0	0	0	1,095	0	0	0
	Canadair Regional Jet 900	3,314	1,158	982	442	315	156	0	0	333	167	0	0	343	176	0	0
	Embraer 175	4,494	5,428	7,794	8,810	11,665	14,609	16,623	18,602	12,283	15,666	18,185	20,714	12,624	16,416	19,378	22,406
	Embraer RJ 135/140/145	210	220	0	162	0	0	0	0	0	0	0	0	0	0	0	0
	Pilatus PC-12	0	512	174	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Domestic		25,542	19,958	27,622	29,980	31,352	34,952	39,361	44,057	33,014	37,479	43,060	49,057	33,882	39,219	45,818	52,990
International	Airbus A319	182	216	0	38	19	0	0	0	20	0	0	0	20	0	0	0
	Airbus A320	128	68	0	4	2	0	0	0	2	0	0	0	2	0	0	0
	Airbus A321	26	12	0	14	50	76	86	96	52	81	93	106	53	84	98	113
	Boeing 737-400	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Boeing 737-600	204	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Boeing 737-700	1,028	434	180	556	365	0	0	0	385	0	0	0	396	0	0	0
	Boeing 737-800	1,606	716	330	982	605	0	0	0	638	0	0	0	657	0	0	0
	Boeing 737MAX 8	368	0	330	938	2,389	3,664	4,131	4,626	2,508	3,923	4,512	5,143	2,576	4,112	4,809	5,564
	Boeing 787-800	0	0	0	0	0	0	0	0	0	0	0	0	173	173	347	347
Total International		3,560	1,500	840	2,532	3,429	3,741	4,217	4,722	3,604	4,004	4,605	5,248	3,878	4,369	5,253	6,024
Total		29,102	21,458	28,462	32,512	34,781	38,693	43,578	48,779	36,618	41,483	47,665	54,305	37,760	43,587	51,072	59,014

Source: *Unison Consulting, Inc.*

Note: *Fleet detail by airline is available.*

Table 2-18: Peak Month Average Day Peak Hour Commercial Passenger Aircraft Operations

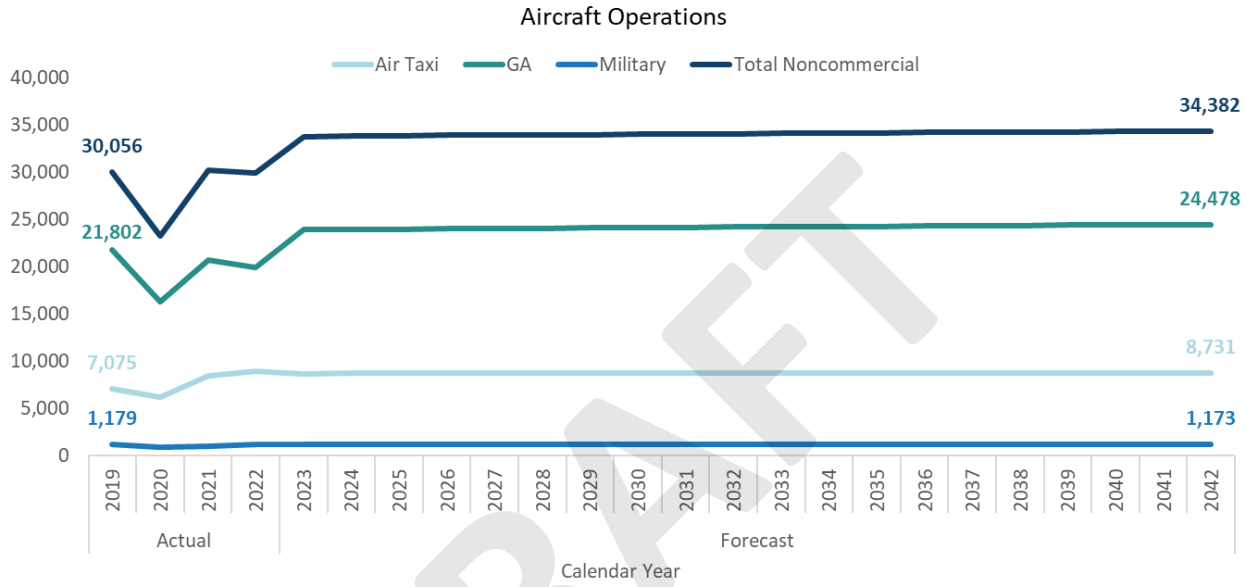
	Actual	Forecast			
	2022	2027	2032	2037	2042
Scenario 1 (Low)					
Annual Operations	32,512	34,781	38,693	43,578	48,779
Peak Month Share of Annual Operations	11.5%	11.5%	11.5%	11.5%	11.5%
Peak Month Total Operations	3,734	3,995	4,444	5,005	5,603
Peak Month Average Day (PMAD) Operations	120	129	143	161	181
Peak Hour Share of PMAD Operations	14.4%	14.4%	14.4%	14.4%	14.4%
PMAD Peak Hour Total Operations	536	573	638	718	804
PMAD Average Peak Hour Operations	17	18	21	23	26
Scenario 2 (Base)					
Annual Operations	32,512	36,618	41,483	47,665	54,305
Peak Month Share of Annual Operations	11.5%	11.5%	11.5%	11.5%	11.5%
Peak Month Total Operations	3,734	4,206	4,765	5,475	6,237
Peak Month Average Day (PMAD) Operations	120	136	154	177	201
Peak Hour Share of PMAD Operations	14.4%	14.4%	14.4%	14.4%	14.4%
PMAD Peak Hour Total Operations	536	604	684	786	895
PMAD Average Peak Hour Operations	17	19	22	25	29
Scenario 3 (High)					
Annual Operations	32,512	37,760	43,587	51,072	59,014
Peak Month Share of Annual Operations	11.5%	11.5%	11.5%	11.5%	11.5%
Peak Month Total Operations	3,734	4,337	5,006	5,866	6,778
Peak Month Average Day (PMAD) Operations	120	140	161	189	219
Peak Hour Share of PMAD Operations	14.4%	14.4%	14.4%	14.4%	14.4%
PMAD Peak Hour Total Operations	536	622	718	842	973
PMAD Average Peak Hour Operations	17	20	23	27	31

Sources: *Historical data from Airport records, OAG schedules, and forecasts by Unison Consulting, Inc.*

NONCOMMERCIAL AVIATION ACTIVITY – FORECASTS

Figure 2-28 summarizes the forecasts for GA, military, and air taxi operations. Overall, total noncommercial aircraft operations, including air taxi and military aircraft operations, are expected to stay stable over the forecast period. Based aircraft (not shown) are expected to increase by 2 annually from 76 in 2023 (Airport Data and Information Portal, accessed in March 2023) to 114 by 2042.

Figure 2-28: Forecast Noncommercial Aircraft Operations by Calendar Year



Sources: *2022-2042 FAA Terminal Area Forecasts, Airport Data and Information Portal (ADIP), and forecasts by Unison Consulting, Inc.*

Notes: *Based aircraft, which is not shown, is expected to increase from 76 in 2023 to 114 in 2042.*

FORECAST SUMMARY AND COMPARISON WITH TAF

Table 2-19, **Table 2-20**, and **Table 2-21** summarize the forecasts of air traffic measures for commercial passenger service and noncommercial aviation activity for 2027, 2032, 2037, and 2042 and compare the totals with FAA's TAF as of February 2023.

Under Scenario 1 (Low), the total enplanements are similar to the FAA TAF through 2042. The forecast total aircraft operations are 2 percent lower in 2027, 4 percent lower in 2032 and 2037, and 5 percent lower in 2042. Scenario 1 (Low) is recommended for financial planning sensitivity analysis.

Under Scenario 2 (Base), relative to the TAF, the forecast total enplanements are 7 percent higher in 2027, 9 percent higher in 2032, 11 percent higher in 2037, and 13 percent higher in 2042. The forecast total aircraft operations are similar to the FAA TAF forecasts in 2027 and 2032 and around 1 percent higher in 2037 and 2042. Scenario 2 (Base) is the recommended Master Plan base forecast scenario for FAA approval.

Under Scenario 3 (High), relative to the TAF, the forecast total enplanements are 13 percent higher in 2027, 17 percent higher in 2032, 23 percent higher in 2037, and 26 percent higher in 2042. The forecast total aircraft operations are 3 percent higher in 2027 and 2032, 5 percent higher in 2037, and 7 percent higher in 2042. Scenario 3 (High) is recommended as the high scenario for terminal planning.

The based aircraft forecasts are the same in all three scenarios. They are lower than the TAF mainly because the actual number of based aircraft at PSP in 2023 is significantly lower than predicted in the TAF (69 actual versus 84 predicted by the TAF). The based aircraft forecasts are 9 percent lower in 2027, 8 percent lower in 2032, 7 percent lower in 2037 and 2042.

Table 2-19: Forecast Enplanements and Aircraft Operations Compared with TAF – Scenario 1 (Low)

Scenario 1 (Low)	Actual				Forecast				Compound Annual Growth Rate			Percent of 2019 Level	
	2019	2020	2021	2022	2027	2032	2037	2042	2019-2022	2022-2032	2032-2042	2032	2042
Commercial Passenger Service													
Enplaned Passengers (1,000s)	1,287	632	1,048	1,501	1,768	2,009	2,269	2,543	5.2%	3.0%	2.4%	156.0%	197.5%
FAA TAF	1,311	825	793	1,447	1,767	2,011	2,267	2,547	3.4%	3.3%	2.4%	153.4%	194.3%
Percent of TAF	98.2%	76.7%	132.2%	103.7%	100.1%	99.9%	100.1%	99.8%					
Aircraft Operations													
Commercial Passenger Carriers	29,102	21,458	28,462	32,512	34,781	38,693	43,578	48,779	3.8%	1.8%	2.3%	133.0%	167.6%
Air Taxi	7,075	6,130	8,448	8,872	8,726	8,731	8,731	8,731	7.8%	-0.2%	0.0%	123.4%	123.4%
General Aviation	21,802	16,294	20,736	19,927	24,043	24,188	24,333	24,478	-3.0%	2.0%	0.1%	110.9%	112.3%
Military	1,179	868	1,012	1,174	1,173	1,173	1,173	1,173	-0.1%	0.0%	0.0%	99.5%	99.5%
Total	**59,158**	**44,750**	**58,658**	**62,485**	**68,723**	**72,784**	**77,815**	**83,160**	**1.8%**	**1.5%**	**1.3%**	**123.0%**	**140.6%**
FAA TAF	60,240	45,555	52,725	63,467	69,963	75,481	81,229	87,498	1.8%	1.7%	1.5%	125.3%	145.2%
Percent of TAF	98.2%	98.2%	111.3%	98.5%	98.2%	96.4%	95.8%	95.0%					
Based Aircraft													
Number of Based Aircraft	81	81	81	83	84	94	104	114	0.8%	1.3%	1.9%	116.0%	140.7%
FAA TAF	81	81	81	83	92	102	112	122	0.8%	2.1%	1.8%	125.9%	150.6%
Percent of TAF	100.0%	100.0%	100.0%	100.0%	91.3%	92.2%	92.9%	93.4%					

Sources: *Historical data from Airport records, FAA ATADS and TAF, T100 data, and forecasts by Unison Consulting, Inc.*

Note: *TAF data is on federal fiscal year ending in September.*

Table 2-20: Forecast Enplanements and Aircraft Operations Compared with TAF – Scenario 2 (Base)

Scenario 2 (Base)	Actual				Forecast				Compound Annual Growth Rate			Percent of 2019 Level	
	2019	2020	2021	2022	2027	2032	2037	2042	2019-2022	2022-2032	2032-2042	2032	2042
Commercial Passenger Service													
Enplaned Passengers (1,000s)	1,287	632	1,048	1,501	1,891	2,188	2,522	2,876	5.2%	3.8%	2.8%	170.0%	223.4%
FAA TAF	1,311	825	793	1,447	1,767	2,011	2,267	2,547	3.4%	3.3%	2.4%	153.4%	194.3%
Percent of TAF	98.2%	76.7%	132.2%	103.7%	107.0%	108.8%	111.2%	112.9%					
Aircraft Operations													
Commercial Passenger Carriers	29,102	21,458	28,462	32,512	36,618	41,483	47,665	54,305	3.8%	2.5%	2.7%	142.5%	186.6%
Air Taxi	7,075	6,130	8,448	8,872	8,726	8,731	8,731	8,731	7.8%	-0.2%	0.0%	123.4%	123.4%
General Aviation	21,802	16,294	20,736	19,927	24,043	24,188	24,333	24,478	-3.0%	2.0%	0.1%	110.9%	112.3%
Military	1,179	868	1,012	1,174	1,173	1,173	1,173	1,173	-0.1%	0.0%	0.0%	99.5%	99.5%
Total	**59,158**	**44,750**	**58,658**	**62,485**	**70,561**	**75,575**	**81,902**	**88,687**	**1.8%**	**1.9%**	**1.6%**	**127.8%**	**149.9%**
FAA TAF	60,240	45,555	52,725	63,467	69,963	75,481	81,229	87,498	1.8%	1.7%	1.5%	125.3%	145.2%
Percent of TAF	98.2%	98.2%	111.3%	98.5%	100.9%	100.1%	100.8%	101.4%					
Based Aircraft													
Number of Based Aircraft	81	81	81	83	84	94	104	114	0.8%	1.3%	1.9%	116.0%	140.7%
FAA TAF	81	81	81	83	92	102	112	122	0.8%	2.1%	1.8%	125.9%	150.6%
Percent of TAF	100.0%	100.0%	100.0%	100.0%	91.3%	92.2%	92.9%	93.4%					

Sources: *Historical data from Airport records, FAA ATADS and TAF, T100 data, and forecasts by Unison Consulting, Inc.*

Note: *TAF data is on federal fiscal year ending in September.*

Table 2-21: Forecast Enplanements and Aircraft Operations Compared with TAF – Scenario 3 (High)

Scenario 3 (High)	Actual				Forecast				Compound Annual Growth Rate			Percent of 2019 Level	
	2019	2020	2021	2022	2027	2032	2037	2042	2019-2022	2022-2032	2032-2042	2032	2042
Commercial Passenger Service													
Enplaned Passengers (1,000s)	1,287	632	1,048	1,501	2,001	2,355	2,784	3,215	5.2%	4.6%	3.2%	182.9%	249.7%
FAA TAF	1,311	825	793	1,447	1,767	2,011	2,267	2,547	3.4%	3.3%	2.4%	153.4%	194.3%
Percent of TAF	98.2%	76.7%	132.2%	103.7%	113.3%	117.1%	122.8%	126.2%					
Aircraft Operations													
Commercial Passenger Carriers	29,102	21,458	28,462	32,512	37,760	43,587	51,072	59,014	3.8%	3.0%	3.1%	149.8%	202.8%
Air Taxi	7,075	6,130	8,448	8,872	8,726	8,731	8,731	8,731	7.8%	-0.2%	0.0%	123.4%	123.4%
General Aviation	21,802	16,294	20,736	19,927	24,043	24,188	24,333	24,478	-3.0%	2.0%	0.1%	110.9%	112.3%
Military	1,179	868	1,012	1,174	1,173	1,173	1,173	1,173	-0.1%	0.0%	0.0%	99.5%	99.5%
Total	**59,158**	**44,750**	**58,658**	**62,485**	**71,702**	**77,679**	**85,309**	**93,395**	**1.8%**	**2.2%**	**1.9%**	**131.3%**	**157.9%**
FAA TAF	60,240	45,555	52,725	63,467	69,963	75,481	81,229	87,498	1.8%	1.7%	1.5%	125.3%	145.2%
Percent of TAF	98.2%	98.2%	111.3%	98.5%	102.5%	102.9%	105.0%	106.7%					
Based Aircraft													
Number of Based Aircraft	81	81	81	83	84	94	104	114	0.8%	1.3%	1.9%	116.0%	140.7%
FAA TAF	81	81	81	83	92	102	112	122	0.8%	2.1%	1.8%	125.9%	150.6%
Percent of TAF	100.0%	100.0%	100.0%	100.0%	91.3%	92.2%	92.9%	93.4%					

Sources: *Historical data from Airport records, FAA ATADS and TAF, T100 data, and forecasts by Unison Consulting, Inc.*

Note: *TAF data is on federal fiscal year ending in September.*

Chapter 3 – Terminal Area Facility Requirements

INTRODUCTION

This chapter summarizes assumptions used to develop facility requirements for the key functional areas of the terminal building. Terminal facility requirements were developed based on meetings and surveys with Palm Springs International Airport (PSP) staff, Transportation Security Administration (TSA), concessionaires, airlines, and rental car companies, a walk-through site evaluation, knowledge of industry-wide trends, and published guidelines. Facility requirements were generated for aircraft parking positions/gates, ticketing area and airline ticket offices, passenger security screening, departure lounges, concessions, restrooms, baggage handling systems and baggage makeup areas, baggage claim, and airport administrative areas. Terminal facility requirements are developed for the peak hour, identified in the forecast section of this document to determine the Airport's needs to accommodate future growth. Secondary functions such as circulation, building systems, administrative areas, and support areas were also considered in the analysis. Additionally, the terminal facility requirements include requirements for the terminal curbfront, parking facilities, and rental car facilities.

Passenger Terminal Facility Requirement Assumptions and Methodologies

This section assesses the capability of the existing terminal facility to accommodate forecast peak hour demand. The assumptions used to inform the models used to establish characteristics (or attributes) and processing rates specific to PSP are described in this section. Assumptions were developed based on the following industry references and standards:

- Airport Development Reference Manual (ADRM) 12TH Edition, 2022; International Air Transportation Association

- FAA Advisory Circular 150/5360-13A: Airport Terminal Planning and Reference Materials
- Airport Cooperative Research Program (ACRP) Report 25: *Airport Passenger Terminal Planning and Design* and references.
- Airport Cooperative Research Program (ACRP) Report 226: Planning and Design of Airport Terminal Restrooms and Ancillary Spaces
- Airport Cooperative Research Program (ACRP) Report 54: *Resource Manual for Airport In-Terminal Concessions*
- TSA Checkpoint Requirements and Planning Guide, 2022
- TSA Planning Guidelines and Design Standards for Checked Baggage Inspection Systems, Version 7.0, August 21, 2020

Planning Activity Levels

For the purposes of master planning, the requirements presented herein are tied to four Planning Activity Levels (PALs). The use of PALs rather than years provides PSP with flexibility to plan for implementation of future projects based on actual growth in traffic, rather than a point in time. The associated activity levels for each PAL are shown in **Table 3-1.** The PALs were selected based on design day flight schedules (DDFS) that were created from the forecasts presented in *Chapter 2, Aviation Activity Forecasts.* The various DDFS for each PAL shows how PSP's daily activity can grow over time. Projecting the type of growth in the design day daily activity came from discussions with the Airport's air service development team, benchmarking peer airports that are currently serving the type of demand PSP is projected to have and evaluating the most demanded unserved markets from PSP. The type of growth to the future design days included:

- **Up-gauge in aircraft type:** As seen across the industry, flights currently being operated on regional jets and older mainline aircraft were assumed to be up-gauged to newer aircraft.
- **Added frequency to currently served markets**: PSP currently serves all of the main hubs for the legacy carriers (American Airlines, United Airlines, Delta Air Lines) in the Midwest and West coast. For the future DDFS, it was assumed daily frequency would be added to these hubs.
- **New markets served**: Through consultation with PSP's air service group, new domestic and international markets were added to the future design day with existing and new carriers.

Table 3-1: Planning Activity Levels

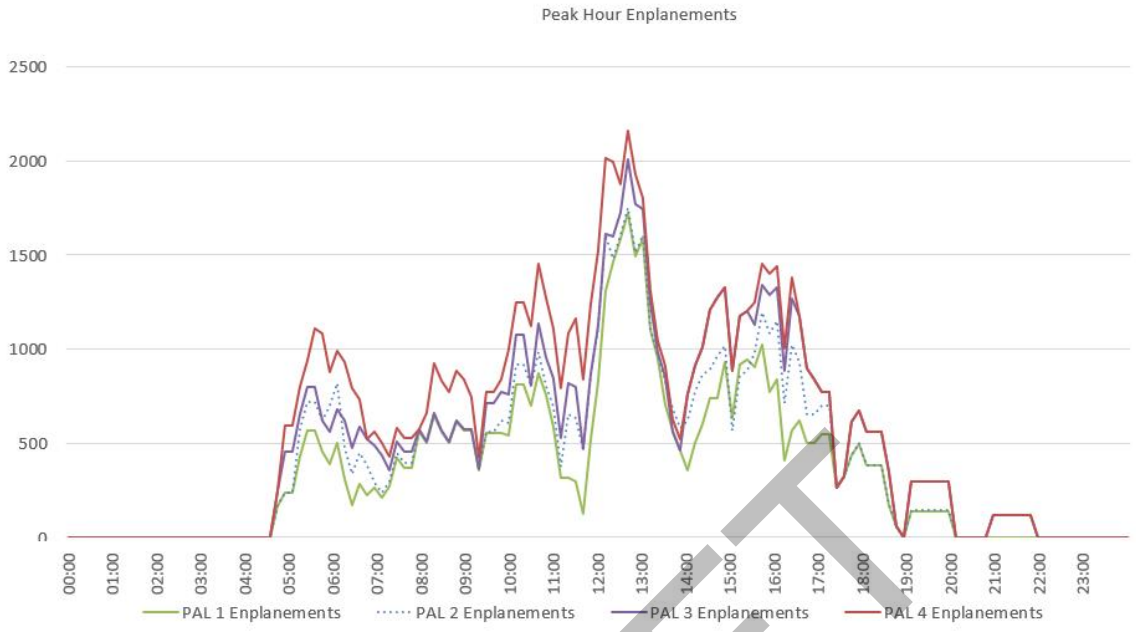
	Existing	PAL 1	PAL 2	PAL 3	PAL 4
Million Annual Passengers (MAP)	3,000,000	4,000,000	4,700,000	5,400,000	6,400,000
Total Annual Commercial Operations	32,512	38,000	44,000	52,000	60,000
Peak Hour Departing Time	12:45-13:40	12:45-13:40	12:45-13:40	12:45-13:40	12:20-13:15
Peak Hour Departing Operations	13	15	15	17	18
Peak Hour Enplanements	1,589	1,727	1,757	2,008	2,163
Peak Hour Arrivals Time	11:40-12:35	11:40-12:35	11:41-12:40	11:50-12:45	11:41-12:40
Peak Hour Arriving Operations	13	15	16	18	22
Peak Hour Deplanements	1,638	1,773	1,908	2,224	2,567
Peak Hour Total Time	11:50-12:45	12:10-13:05	12:10-13:05	12:10-13:05	12:20-13:15
Peak Hour Commercial Operations	17	20	23	27	31
Total Peak Hour Passengers	2,084	2,712	3,021	3,343	3,743

Source: *Mead & Hunt, 2023.*
Note: *PAL = Planning Activity Levels.*

The design day flight schedules defined the future peaking characteristics for the various PALs.

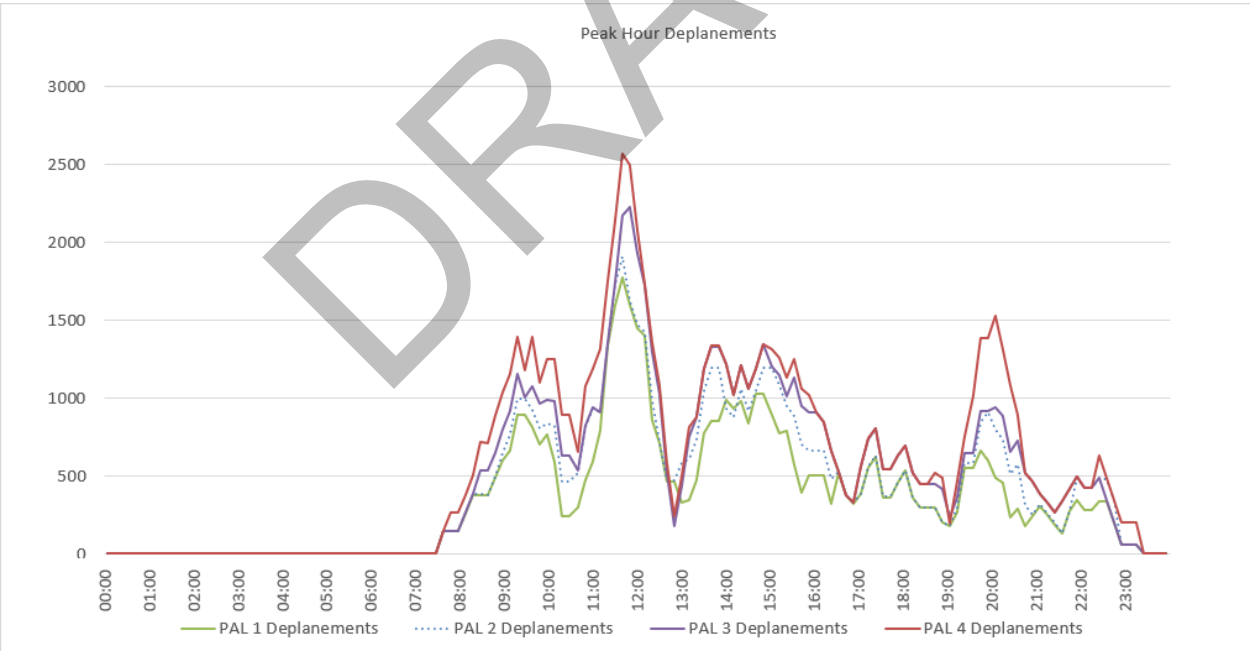
Figure 3-1, **Figure 3-2**, and **Figure 3-3** show how the daily activity evolves over time. Terminal programming is fundamentally determined based on the Airport's peaking characteristics throughout the day. It is important to note that although, the peak hour grows over this planning period, it does not grow proportionally with overall enplanements. This can be explained by the assumption that design day will grow with future flights being scheduled in current off-peak times due to the added frequency to already served markets rather than adding a flight to the same destination during the peak time. For example, if there is an existing flight during the peak hour to Chicago O'Hare International Airport (ORD). That airline will not add another flight to the same destination at the same time. Instead, they would either up-gauge the aircraft or a add flight earlier or later in the day to ORD that lined up with that airline's hub departure bank out of ORD.

Figure 3-1: PSP Peak Hour Enplanements



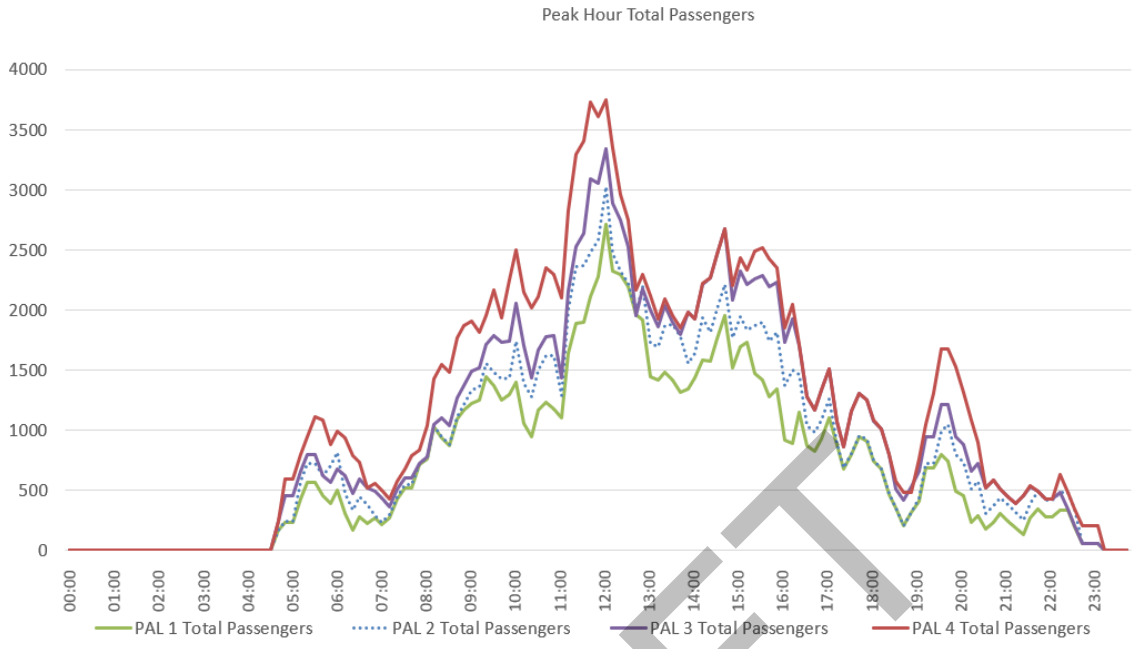
Source: *Mead & Hunt, 2023.*

Figure 3-2: PSP Peak Hour Deplanements



Source: *Mead & Hunt, 2023.*

Figure 3-3: PSP Peak Hour Total Passengers



Source: *Mead & Hunt, 2023.*

Methodologies

Facility requirements for PSP were calculated by using assumptions in optimum space and waiting times determined by International Air Transport Association (IATA), passenger attributes, and show-up profiles. Once the requirement of a certain terminal component was determined such as the number of check-in counters, kiosks, bag-drop stations, checkpoint lanes, explosive detection scanners, baggage claim carousels, departure lounges, etc., a template of that space was developed to determine the proposed space for the various planning activity levels.

Terminal Planning Level-of-Service

The IATA has developed and refined a comprehensive set of standards for evaluating and planning passenger terminals utilizing the level-of-service (LOS) concept as shown in **Table 3-2**. The LOS framework published in the IATA ADRM (12th Edition) centers around three categories of level-of-design for passenger terminal facilities:

1. **Over-Design:** Excessive space and over provision of resources
2. **Optimum:** Sufficient space to accommodate the necessary functions in a comfortable environment, and acceptable processing and waiting times.
3. **Sub-Optimum:** Crowded and uncomfortable, and unacceptable processing and waiting times.

Table 3-2: Terminal Planning Level of Service

LOS Parameters			Space		
			Over-Design	Optimum	Sub-Optimum (consider improvements)
			Excessive or empty areas	Sufficient space to accommodate necessary functions in a comfortable environment	Crowded and uncomfortable
Queuing Time	Over-Design	Overprovision of Resources	OVER-DESIGN	OPTIMUM	SUB-OPTIMUM (consider improvements)
	Optimum	Acceptable queuing times	OPTIMUM	OPTIMUM	SUB-OPTIMUM (consider improvements)
	Sub-Optimum	Unacceptable queuing times	SUB-OPTIMUM (consider improvements)	SUB-OPTIMUM (consider improvements)	UNDER-PROVIDED (reconfigure)

Source: *Mead & Hunt, 2023.*

These three categories are defined by variables of queuing time and space provided. To provide a sufficient passenger terminal facility, passengers are expected to not be waiting in a queue for a certain amount of time and have sufficient space throughout the experience in the terminal. The Optimum LOS space and waiting time standards for the core passenger processing areas are summarized in **Table 3-3**. The recommended improvements to functional areas also consider minimizing total passenger processing time in order to maximize convenience to the extent practical.

Table 3-3: LOS Parameters

PASSENGER TERMINAL PROCESSOR	NOTES	SPACE GUIDELINES (ft2/passenger unless otherwise noted) IATA				MAXIMUM WAITING TIME GUIDELINES FOR PROCESSING FACILITIES (minutes) Economy Class (min)				(minutes) Business Class/First Class (min)				OTHER GUIDELINES AND REMARKS	
ADRM 9th Edition		A B	C	D	E	A B	C	D	E	A B	C	D	E	A B	C	D	E		
ADRM 11th Edition		Over-Design	Optimum	Sub-Optimum	Under-Provided	Over-Design	Optimum	Sub-Optimum	Under-Provided	Over-Design	Optimum	Sub-Optimum	Under-Provided	Over-Design	Optimum	Sub-Optimum	Under-Provided		
Public Departure Hall		>24.8	21.5–24.8	<21.5		N/A	N/A	N/A		N/A	N/A	N/A		15%–20% *				Optimum proportion of seated occupants	
Check-in																			
Self-Service Kiosk	boarding pass/bag tagging	>19.4	14.0–19.4	<14.0		<0	0–2	>2		<0	0–2	>2							
Bag Drop Desk	queue width 4.5–5.0 ft	>19.4	14.0–19.4	<14.0		<0	0–5	>5		<0	0–3	>3							
Check-in Desk	queue width 4.5–5.0 ft	>19.4	14.0–19.4	<14.0		<10	10–20	>20		Business	3–5	>5							
	queue width 4.5-5.0 ft	>19.4	14.0–19.4	<14.0		<10	10–20	>20		First	1–3	>3							
Security Checkpoint	queue width 4 ft	>12.9	10.8–12.9	<10.8		<5	5–10	>10		Fast Track	1–3	>3							
Gate Holdrooms / Departure Lounges ***						N/A				N/A									
Seated		>23.7	19.4–23.7	<19.4		N/A	N/A	N/A		N/A	N/A	N/A		50%–70% *				Optimum proportion of seated occupants	
Standing		>16.1	12.9–16.1	<12.9		N/A	N/A	N/A		N/A	N/A	N/A							
Baggage Claim Area																			
Narrow Body		>18.3	16.2–18.3	<16.2		<0	0–15	>15		<0	0–15	>15						The first waiting time value relates to "first passengers to first bag." The second waiting time value relates to "last bag on belt" (counting from the first bag delivery). **	
Wide Body		>18.3	16.2–18.3	<16.2		<0	0–25	>25											
Public Arrival Hall		**>24.8**	**21.5–24.8**	**<21.5**		**N/A**	**N/A**	**N/A**		**N/A1**	**N/A**	**N/A**		**15%–20% ***					

Source: *Mead & Hunt, 2023.*

Passenger Attributes

In analyzing passenger activity, the percentage of passengers who check baggage or otherwise use units in the airline check-in area and the time passengers show up at the terminal were considered. The percentage of passengers with checked bags applies to both departing and arriving (destination) passengers while show-up time is an attribute considered for departing (originating enplaned) passengers.

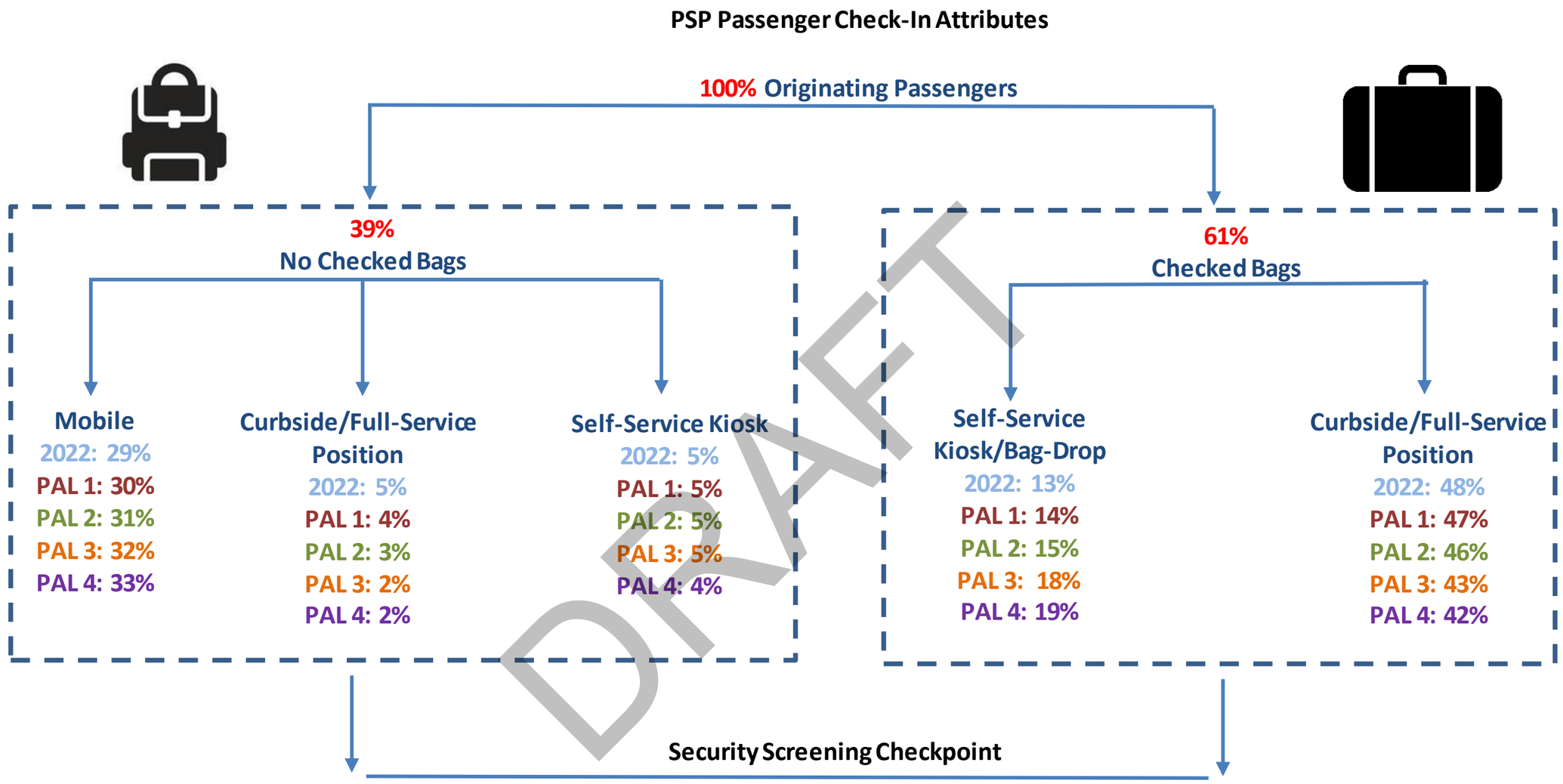
Check-In Type

The check-in type differentiates passenger processes based on the individual characteristics described below. The arrangement and sequence of the process reflects airline-specific check-in protocols and the deployment of emerging technologies in the check-in area throughout the planning horizon. Passenger check-in attributes at PSP are segmented into four categories:

1. **Mobile:** Passengers not having checked bags and obtain their ticket via their mobile device. These passengers by-pass the check-in area.
2. **Self-Service Kiosks:** Passengers using these self-service kiosks can be either passengers not checking bags obtaining their ticket at the Airport or passengers checking-in for the flight and checking a bag. Once the tag is placed on the bag, passengers proceed to a bag drop-off area.
3. **Bag-Drop Position:** These positions are staffed by airline personnel that stand behind the counter and receive the bag from passengers who have placed the tag on their bag from a self-service kiosk.
4. **Full-Service Position:** These positions are also staffed by airline employees and provide a full customer experience to mostly passengers checking baggage or passengers not checking bags who need assistance.

Figure 3-4 illustrates the assumptions of passengers using the various check-in facilities throughout the planning horizon. As shown, the percentage of passengers using mobile devices and kiosks increase while the use of full-service positions is anticipated to decrease.

Figure 3-4: PSP Passenger Check-In Attribute



Source: *Mead & Hunt, 2023.*

Show-Up (Airport Arrival)

A show-up profile is a distribution cure that represents the amount of time passengers arrive at the terminal before their scheduled flight departure. Several factors affect arrival profiles, including the mode of travel to the Airport, class of service, whether the passenger is checking baggage and the time of day. This results in a metering of passengers that directly influences passenger demand throughout the passenger processing system. About 50 percent of peak hour enplanements arrive within a 30-minute period, which was found in the show-up profile study.

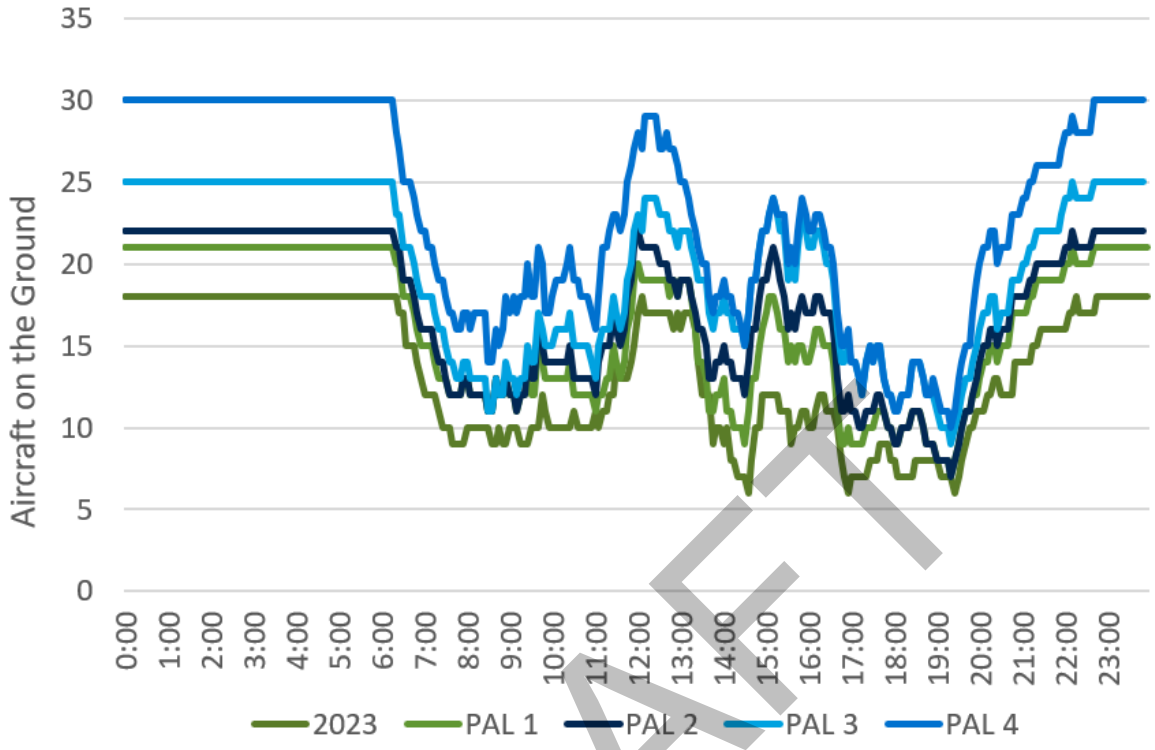
Aircraft Gate Parking Positions

The number of aircraft gates are the most impactful variable that drive future terminal space. A total of 21 parking positions are currently available at PSP. The Bono Concourse has eight gates with an extra parking position at Gate 1 while the Regional Concourse has 10 gates with a extra parking positions at Gates 12 and 20. Although there are 21 parking positions, this analysis used 18 as the number of existing gates since only 18 gates can be processed for departure at any time. The development of projected requirements for the number of passenger aircraft parking requirements involved an Aircraft on Ground (AOG) analysis of the DDFS developed for each PAL. An AOG analysis uses the DDFS to develop a running count of the number of aircraft on the ground throughout the design day by aircraft type and whether they are actively loading or unloading passengers.

During the AOG analysis, aircraft with long ground times were assumed to be towed off of the gate to a remote parking position in this analysis. Towing aircraft off of the gate allows other aircraft to use a position for passenger loading/unloading, which maximizes the utilization of the gates and reduces the need for additional gates. Aircraft were only eligible to be towed if they were at the gate longer than 120 minutes and if the gate was needed by another aircraft. An aircraft cannot be towed during the first 30 minutes after arrival and must be towed back to a gate 45 minutes prior to its departure. In **Figure 3-5** PAL 4 estimates that 30 aircraft are on the ground overnight and that about 29 aircraft are on the ground during the day, which require a gate.

Table 3-4 summarizes the gate requirements for PAL 1 through PAL 4. For this gate analysis, a two-gate contingency was added in the event of maintenance or irregular operations. Instead of this study proposing an exact number of gates, a range of gates are proposed for each planning activity level. Through PAL 4, PSP should anticipate 30-32 gates to be able to accommodate its on-the-ground activity.

Figure 3-5: Aircraft On-the-Ground Analysis



Source: Mead & Hunt, 2023.

Table 3-4: Summary of PSP Gate Requirements

	Existing	PAL 1	PAL 2	PAL 3	PAL 4
Million Annual Passengers	3.0 MAP[2]	4.0 MAP	4.8 MAP	5.6 MAP	6.5 MAP
# of Gates or range of Gates	18	21-23	22-24	25-28	30-32
Year according to high-growth forecasts	-	2026-2027	2032-2033	2037-2038	2042-2043
Year according to baseline forecasts	-	2030-2032	2035-2036	2041-2042	Beyond 20 Yrs.

Source: *Mead & Hunt, 2023.*
Notes: *PAL = Planning Activity Levels.*
MAP = Million Annual Passengers

Airline Check-In

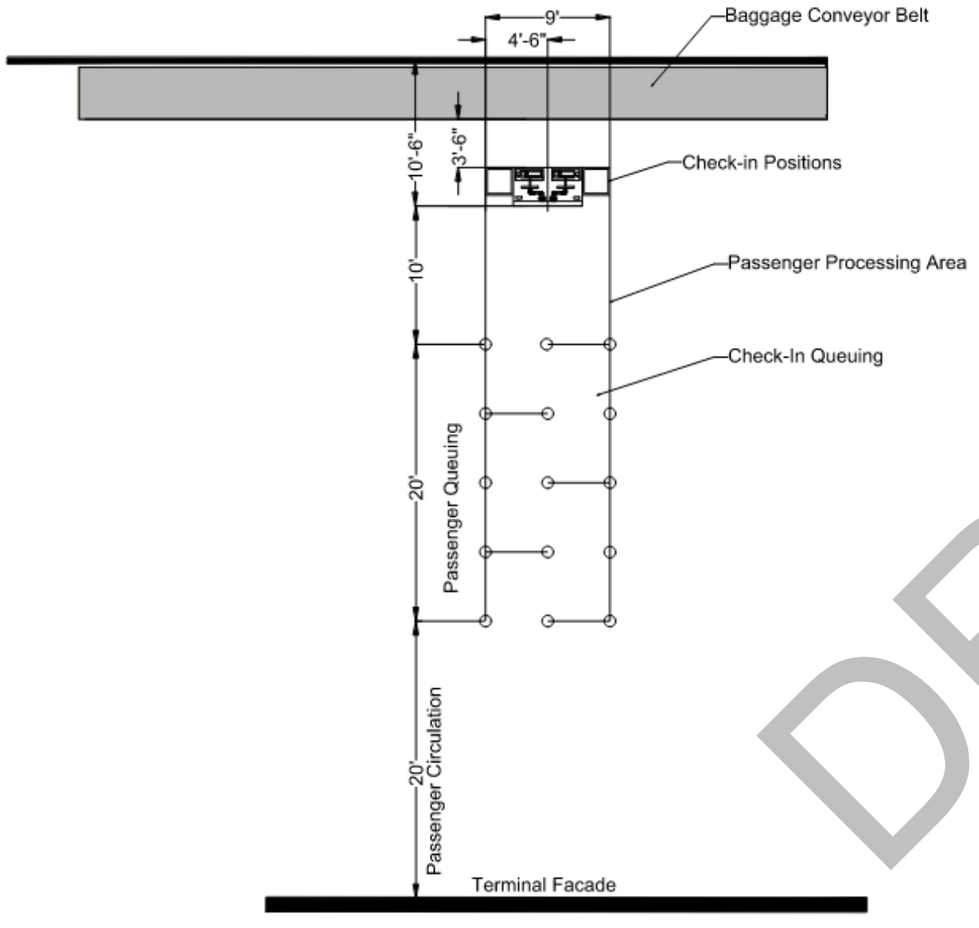
PSP provides a variety of check-in options including full-service check-in counters, bag-drop stations, self-service kiosks, and curbside check-in. Most air carriers are now replacing traditional check-in counters with self-service kiosks due to technological advancements which effectively decrease processing time and staff requirements. For instance, Alaska Airlines was the first airline at PSP to recently deploy kiosks that allow passengers checking bags to check-in from their mobile device and print the baggage tag at the Airport by scanning their boarding ticket, decreasing the amount of processing time for passengers in the ticketing area. These types of changes focusing on technological advancements are assumed to become more popular throughout the planning horizon.

The configuration of airline check-in facilities in airport terminals depend on airline preference as some airlines have adopted emerging check-in technologies and layouts quicker than other airlines. The various configurations may include traditional linear agent counters, island counters, or a mix of remote self-service kiosks and full-service positions, similar to what PSP currently has.

Figure 3-6 illustrates a standard check-in configuration currently at PSP. This template reflects the recent terminal improvement project in 2020 to the Airport's ticketing area where the Airport pushed the wall between the ticketing area and airline ticket office easterly 19-feet. The following elements are included in this airline check-in area configuration:

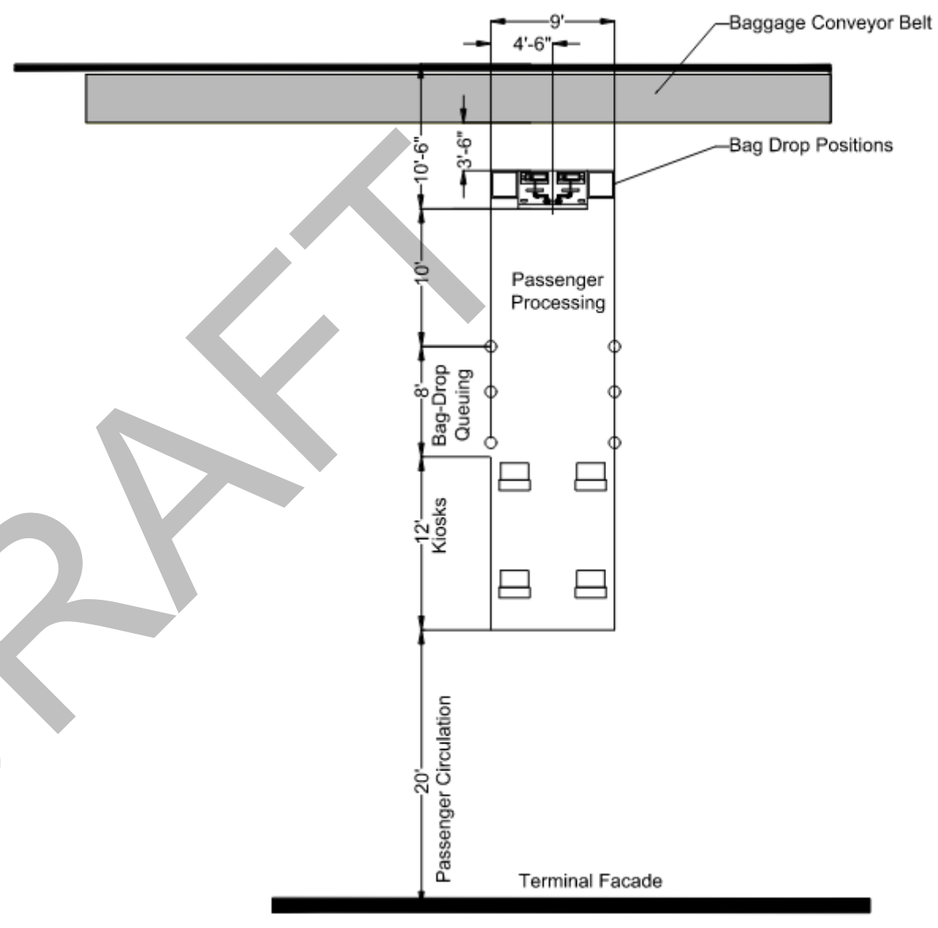
- **Check-in Positions:** The positions staffed by airline employees to check-in passengers using the full-service counters or self-tagging their bags at the kiosks and dropping bags off. Each check-in position is 4.5-feet wide and includes the counter and baggage scale. The depth of each check-in position varies by Airport but should be at least 10.5-feet from the face of the counter to the back wall which allows sufficient space for the counter, airline employees processing passengers, and baggage system infrastructure.
- **Passenger Processing Area:** The area in front of the counters where passengers stand with their baggage while being processed by the airline employees. The passenger processing area has a depth of at least 10-feet between the front of the counter and queuing space to accommodate the passengers and their baggage getting processed and passengers crossing the check-in area after being processed.
- **Check-in Queue:** The space between the passenger processing area and circulation corridor where passengers wait with their baggage. The width of each aisle of queuing space is between 3.5-feet – 5-feet to allow enough space for passengers requiring additional assistance to maneuver safely. Depending on services offered by the Airline, different queueing lines may be available for passengers using first-class, business-class, or premier access services.
- **Circulation Corridor:** The circulation corridor is the space passengers use to access the check-in area from the front curb and is typically located between the front of the terminal and the check-in queuing area. The width of this space is typically at least 20-feet to comply with International Building Code and kept free of any fixed obstructions to accommodate the cross-circulation for passengers and non-passengers.

Figure 3-6: Typical Two-Counter Check-In Configuration



Queuing Area per Two Agent Counter: 270 SF
Area per Position: 48 SF

Source: ACRP 25 Airport Passenger Terminal Planning and Design Volume 1
Prepared by: Mead & Hunt 2023



Queuing Area per Bag Drop Station: 81 SF
Area per Position: 48 SF

Source: ACRP 25 Airport Passenger Terminal Planning and Design Volume 1
Prepared by: Mead & Hunt 2023

Source: *ACRP 25 Airport Passenger Terminal Planning and Design Volume 1 and Mead & Hunt, 2023.*

The airline check-in lobby template shown in **Figure 3-6** prescribes a planning factor of roughly 48 SF per full-service position and 270 SF of queuing pace per two agent counters**.**

Growth in check-in area requirements were based on the following requirements for the various PALs in addition to the passenger check-in type attributes previously identified:

PAL 1

- New airline enters requiring four FSP and two bag drop stations.
- Existing airline requires two additional FSP and two additional bag drop stations.

PAL 2

- Existing airline requires two additional FSP and two additional bag drop stations as modern technologies emerge.

PAL 3

- Existing airlines requiring four additional FSP and four bag drop stations.

PAL 4

- New airline enters requiring four additional FSP and four bag drop stations.

Based on these assumptions, the space requirements identified in **Table 3-5** are required in the check-in area throughout the planning horizon.

Table 3-5: Check-In Area Requirements

	Existing	2022	PAL[1] 1	PAL 2	PAL 3	PAL 4
Full-Service Positions	51	48	55	57	61	65
Full-Service Position Area	3,300	2,400	2,700	2,800	3,000	3,200
Full-Service Queue Area	6,000	6,500	7,500	7,700	8,300	8,800
Kiosks	24	12	13	14	19	20
Kiosk Position Area	-	500	600	600	800	800
Kiosk Queue Area	-	1,000	1,100	1,200	1,600	1,600
Bag Drop	10	10	14	16	20	24
Bag Drop Area	-	500	700	800	1,000	1,200
Bag Drop Queue Area	-	900	1,200	1,300	1,700	2,000
Ticketing Area Circulation	8,500	7,700	8,800	9,120	9,760	10,400
Total Ticketing Area	**17,800**	**19,500**	**22,600**	**23,520**	**26,160**	**28,000**
Curbside Counters	7	7	7	7	7	7
Curbside Counter Area	-	700	700	700	700	700

Source: *Mead & Hunt, 2023.*

Note: *PAL = Planning Activity Level.*

Baggage Screening

All checked baggage at airports is subject to screening for explosives. The requirements for outbound baggage screening facilities are based on the number of checked bags per passenger during the peak hour as well as the processing rate of the screening equipment.

There are generally two broad categories of Checked Baggage Inspection Systems (CBIS) at airports which use a combination of explosive detection systems (EDS) and explosive trace detector (ETD) units: (1) in-line and (2) stand-alone. Within these two categories there are alternatives that range from highly integrated, highly automated, and low labor-intensive systems to low-automated and high labor-intensive systems.

PSP currently has five CT-80DR+L scanners and anticipating a sixth in the near future. The five scanners are integrated into a conveyor system from the check-in area and curbside counters, however, have the processing rate of a stand-alone machine as personnel are required to manually place bags into and retrieve bags out of the scanner. The existing baggage processing capacity is approximately 820-920 bags per hour. PSP is in the process of redesigning their baggage screening system to convert everything into a fully automated in-line system which will significantly impact the baggage throughput. For example, one stand-alone machine can process 160-200 bags per hour where one in-line machine can process 530-710 bags per hour.

Facility requirements for baggage screening equipment are a function of the percentage of passengers checking bags at the Airport, the types of screening machines, and the amount of additional space needed for conveyors.

Table 3-6 displays the results of the future space requirements for checked baggage screening.

Table 3-6: Baggage Screening Requirements

	Existing	PAL[1] 1	PAL 2	PAL 3	PAL 4
Total # of Bags to Process in Peak Hour	781	844	853	970	1,039
# of EDS[2] Devices (532 bags processed per machine per hour)	5	4	4	4	4
# of Level 2 OSR[3] Stations Required	2	2	2	3	3
# of Level 3 ETD[4] Units Required	3	3	3	4	4
Total Baggage Screening Area	8,900	22,500	22,500	23,100	23,100

Source: *Mead & Hunt, 2023.*

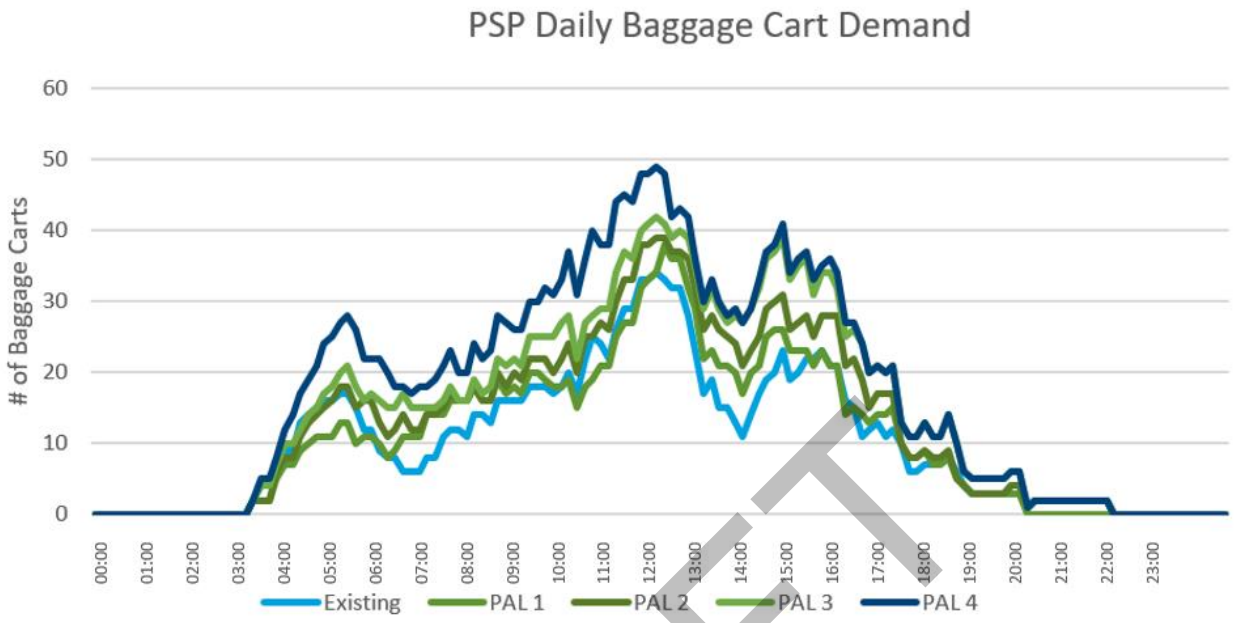
Notes: *[1] PAL = Planning Activity Level.*
[2] EDS = Explosive Detection Systems.
[3] OSR = On-Screen Resolution.
[4] ETD = Explosive Trace Detection.

Outbound Baggage Makeup

Outbound baggage makeup consists of the areas designated for outbound bags to be sorted, handled, and placed on baggage carts for the departing flight following the baggage screen process. This area also consists of ground service equipment circulation. As mentioned in *Chapter 1*, following screening the outbound baggage operation consists of bags being transported to three outbound baggage carousels located outside and covered by aluminum roofs. Up to 16 baggage carts can park parallel to each carousel allowing for approximately 48 carts to stage simultaneously around the carousel. Outbound baggage makeup requirements are a function of the number of baggage carts needed in a two-hour departure window. **Figure 3-7** shows the demand of baggage carts needed throughout the existing and future design days within a three-hour window before the departure. These profiles were developed using the assumptions shown in **Table 3-7** which depicts the number of carts staged ahead of a flight's scheduled departure time.

Figure 3-8 shows a general template for an outbound baggage makeup area configuration. The unit length is based on a 160-foot linear presentation frontage sloped plate device able to accommodate baggage from a typical narrowbody aircraft flight. The makeup unit area includes the carousel equipment, work area, cart staging clearances, and other critical dimensional clearances as follows.

Figure 3-7: PSP Daily Baggage Cart Demand



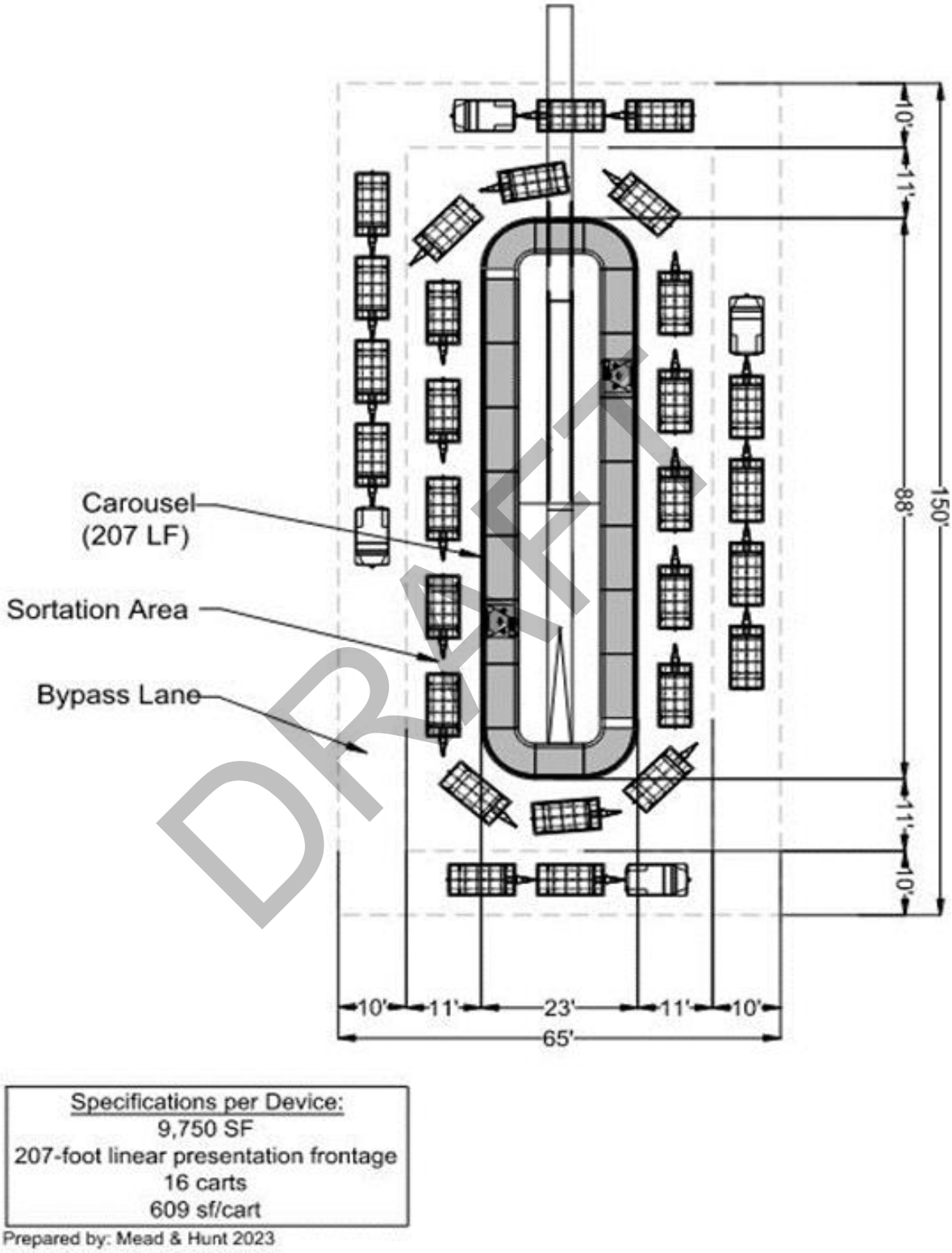
Source: *Mead & Hunt, 2023.*

Table 3-7: Outbound Baggage Makeup Cart Staging Profile

Outbound Baggage Makeup Cart Staging Profile																		
Minutes Prior to Departure	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10
Percentage of Flights Carts Staged	0%	0%	0%	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%

Source: *Mead & Hunt, 2023.*

Figure 3-8: Outbound Baggage Make-Up Area Requirements



Source: *Mead & Hunt, 2023.*

Outbound baggage make-up requirements are presented in **Table 3-8**. Based on the above assumptions, the number of staged carts will not exceed 49. Therefore 39,000 square feet are ultimately required for outbound baggage facilities.

Table 3-8: Outbound Babbage Makeup Area Requirements

	Existing	2022	PAL 1	PAL 2	PAL 3	PAL 4
# of Carts for 2.5 Hour Peak	34	34	38	39	42	49
# of Outbound Baggage Carousels	3	3	3	3	3	4
Total Outbound Baggage Make-Up Area	26,300	29,250	29,250	29,250	29,250	39,000

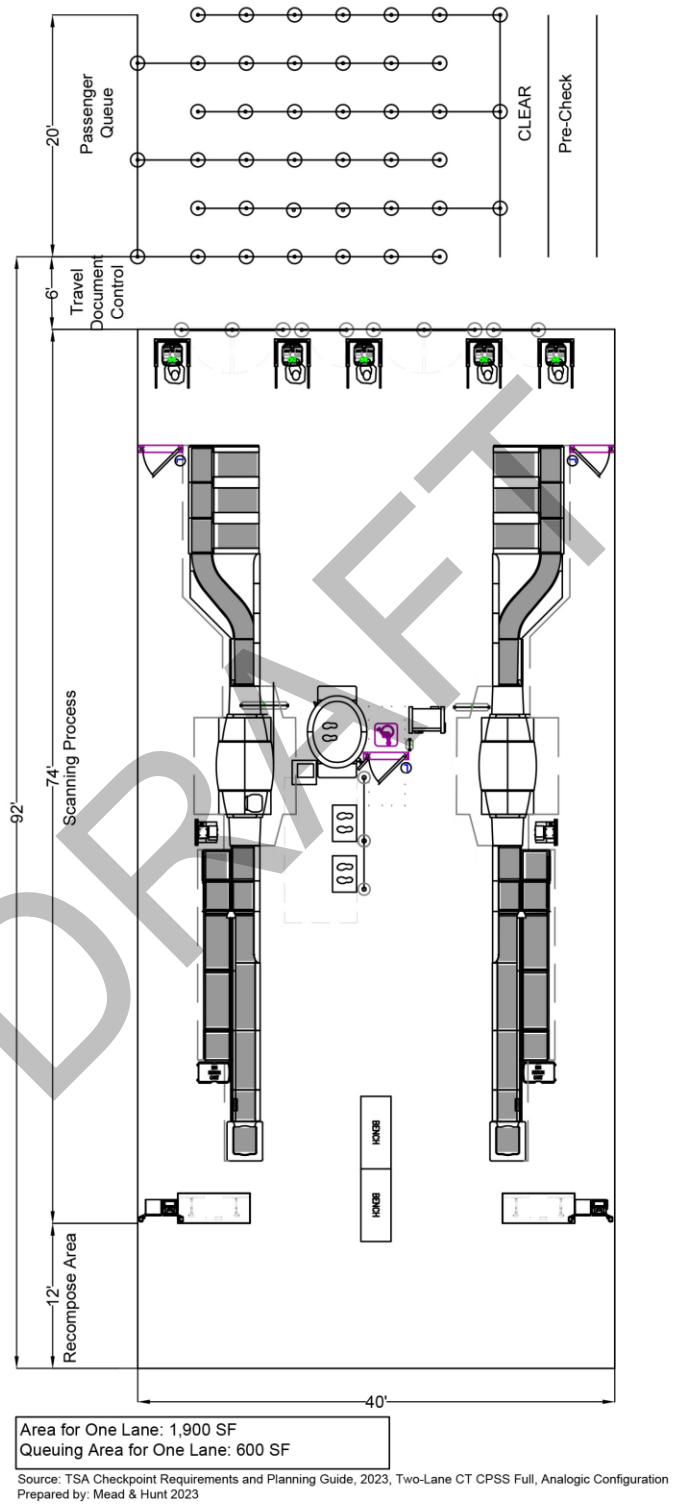
Source: *Mead & Hunt, 2023.*
Note: *PAL = Planning Activity Level.*

Security Screening Checkpoint

PSP currently has a six-lane configuration with a private screening room. Programming space requirements for the security screening checkpoint includes evaluating existing and future peak hour demand, throughput rates passengers using standard lanes and Pre✓ lanes, achieving optimal IATA wait times and space per passenger requirements, and space requirements for screening equipment.

Figure 3-9 illustrates a one-lane configuration referenced in the TSA Checkpoint Requirements and Planning Guide. Based on this layout and defined in the document, a standard AT2 Rapiscan configuration account for 2,550 SF which includes a travel document check area, scanning process area, and an area to recompose. Additionally, 600 SF of queuing space is provided as recommended.

Figure 3-9: Security Screening Checkpoint Two-Lane Configuration



Source: *Mead & Hunt, 2023.*

The security screening checkpoints requirements are shown in **Table 3-9**.

Table 3-9: Security Screening Checkpoint Requirements

	Existing	2022	PAL[1] 1	PAL 2	PAL 3	PAL 4
Peak 30-Minute Passengers	794	794	864	874	1004	1081
% of Passengers using Standard Lanes	55%					
% of Passengers using Pre✓	45%					
# of Standard Lanes	5	4	4	4	5	6
# of Pre✓ Lanes	1	3	3	3	3	4
Total SSCP2 Area	**13,354**	**18,900**	**18,900**	**18,900**	**21,600**	**27,000**

Source: *Mead & Hunt, 2023.*

Notes: *[1] PAL = Planning Activity Level.*

[2] SSCP = Security Screening Check Point.

Departure Lounges

The basis for calculations of departure lounge requirements is the number of gates, aircraft seating capacity per gate, average aircraft load factor, the physical layout of the departure lounge, and the number of seated vs. standing passengers. Facility requirements for departure lounges at PSP were determined based on regional jet (RJ), narrow-body (NB), and wide-body (WB) gates. The assumptions and requirements for departure lounges are identified in **Table 3-10** and **Table 3-11,** respectively.

Table 3-10: Departure Lounge Programming Requirements

	RJ[1]	NB[2]	WB[3]
Aircraft Seats	90	190	216
Load Factor (%)	80%	80%	80%
Seated Passenger Population (%)	70%	70%	70%
Area per Seated Passenger (SF[4])	23.7	23.7	23.7
Standing Passenger Population (%)	20%	20%	20%
Area per Standing Passenger (SF)	16.1	16.1	16.1
Standing Passenger in Queue (%)	10%	10%	10%
Area per Standing Passenger in Queue (SF)	12.9	12.9	12.9
Area per Podium (100 SF / 1 Podium)	100	100	100
Boarding Pass Readers (SF)	40	40	40
Boarding/Egress Aisle (SF)	210	210	210
Area Per Departure Lounge	**1,870**	**3,560**	**4,000**

Source: *Mead & Hunt, 2023.*

Notes: *[1] RJ = Regional Jet.*
[2] NB = Narrow Body.
[3] WB = Wide Body.
[4] SF = Square Footage.

Table 3-11: Summary of Departure Lounge Requirements

	Existing	2022	PAL[1] 1	PAL 2	PAL 3	PAL 4
# of RJ[2] Gates	1	0	0	0	0	0
# of NB[3] Gates	17	20	22	23	26	30
# of WB[4] Gates	0	0	1	1	1	2
Total Gates	**18**	**20**	**23**	**24**	**27**	**32**
Total Area for Departure Lounge	**29,242**	**71,200**	**82,320**	**85,880**	**96,560**	**114,800**

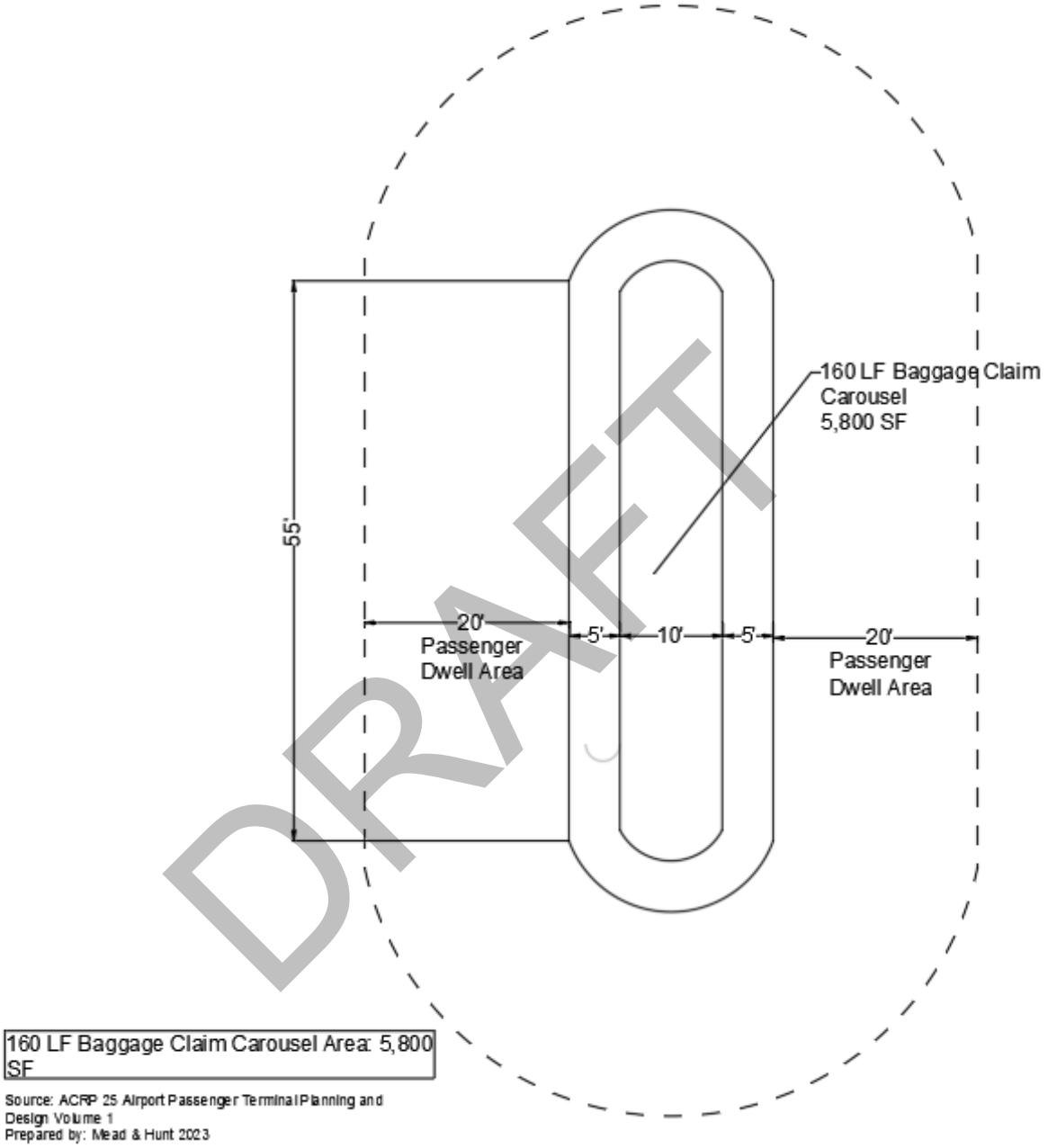
Source: *Mead & Hunt, 2023.*

Notes: *[1] PAL = Planning Activity Level.*
[2] RJ = Regional Jet.
[3] NB = Narrow Body.
[4] WB = Wide Body.

Baggage Claim and Inbound Baggage Handling

The baggage claim area at PSP currently consists of three U-Shaped, flat-plated carousels that are fed inbound baggage through an inbound baggage lane on the other side of the secure/non-secure wall. Additionally, the rental car counters and queuing are located adjacent to the baggage claim area and often become congested when passengers queued for rental cars will spill over into the baggage claim area and intersect passenger circulation. PSP is currently undergoing a design to add a fourth carousel and convert all carousels into slope-faced carousels. Due to the transition into slope-faced carousels the space template used for this study is shown in **Figure 3-10.** The space template includes a 160-ft. carousel with a 20-ft. buffer for passenger dwelling which is sufficient for holding two narrowbody arrivals simultaneously.

Figure 3-10: Baggage Claim and Inbound Baggage Makeup Area for 100 LF Carousel



Source: *Mead & Hunt, 2023.*

The number of carousels and space needed throughout the planning horizon was determined based on the number of arrivals in the peak-20 minutes of the future design day schedules.

The summary of baggage claim area requirements can be found in **Table 3-12**. This space includes additional space for baggage service offices which includes a 150 SF office for every airline having five or more daily departures.

Table 3-12: Summary of Baggage Claim Area Requirements

	Existing	2022	PAL 1	PAL 2	PAL 3	PAL 4
Peak 20-Minute # of Arrivals	7	7	9	9	9	10
Peak 20-Minute # of Bags	445	445	595	595	595	687
Total People at Claim	290	290	387	387	387	447
Claim Frontage per Person	435	435	581	581	581	671
# of Carousels	3	3	4	4	4	5
Total Baggage Claim Area	11,390	18,300	24,100	24,100	24,200	30,260
1 PAL: Planning Activity Level						

Source: *Mead & Hunt, 2023.*

Space designated for inbound baggage includes space used for GSE circulation and equipment facilitating the transfer of bags from the baggage carts to the carousel. With the shift going to slope-faced carousels, additional inbound baggage make-up space will be needed to support the change in grade of conveyor systems. **Table 3-13** summarizes the updated inbound baggage makeup requirements which includes space for offload belts, driving lanes, and conveyor belt circulation.

Table 3-13: Summary of Inbound Baggage Makeup Area Requirements

	Existing	2022	PAL 1[1]	PAL 2	PAL 3	PAL 4
# of Baggage Claim Carousels	3	3	4	4	4	5
Total SF[2] for Inbound Baggage Make Up	1,920	10,500	14,000	14,000	14,000	17,500
1 PAL: Planning Activity Level 2 SF: Square Footage						

Source: *Mead & Hunt, 2023.*

Customs and Border Protection

All international passengers must be processed at a point-of-entry (POE) prior to entering the United States, whether or not they are terminating their journey at the Airport or connecting to a domestic flight. Each POE is a fully independent facility within the Airport, with Customs and Border Protection (CBP) administrative offices and facilities capable of processing, terminating, and connecting passengers. A POE typically includes the following facilities:

- **Sterile Corridor**: This is a secure corridor for international passengers deplaning and entering the primary processing area.
- **Primary Processing**: The initial passenger screening to process passports consists primarily of Automated Passport Control and Global Entry kiosks. Global Entry is part of CBP's Trusted Traveler program; it allows the expedited clearance of pre-approved, low-risk travelers into the United States.
- **International Baggage Claim:** This baggage claim hall is for international passengers; all passengers must reclaim their bags prior to exiting the POE.
- **Exit Control/Inspection Area:** This represents the final stages of the POE process. Typically, passengers with reclaimed baggage are inspected by Officers at podiums before proceeding to exit the POE into the US Territory. However, if an officer recommends further search of a passenger or baggage, then the targeted party must be processed through secondary screening.
- **Secondary Processing:** Secondary screening areas accommodate the screening of passengers and baggage not permissible into the United States.

Currently, no international air carrier flights that are not pre-cleared serve PSP. However, throughout the planning horizon, it is anticipated international carriers to enter the market that would require a CBP facility. Sizing the CBP facility depends on the peak hour international passengers. If more than 250 international passengers require processing, a larger CBP footprint is required. For PSP, it is anticipated the number of international passengers being processed will exceed 250 at PAL 1 with a B787 and narrowbody being processed simultaneously. **Table 3-14** summarizes the facility requirements for CBP activities.

Table 3-14: Federal Inspection Services Requirements

	Existing	2022	PAL 1	PAL 2	PAL 3	PAL 4
Peak Hour International Passengers	-	151	251	251	251	251
Primary Processing and Inspection (sf)	-	8,000	10,000	10,000	10,000	10,000
Secondary Processing and Inspection (sf)	-	2,000	2,000	2,000	2,000	2,000
Support Spaces (sf)	-	8,000	8,000	8,000	8,000	8,000
Total FIS Area	-	**18,000**	**20,000**	**20,000**	**20,000**	**20,000**

Source: *Mead & Hunt, 2023.*

Concessions

A concessions program includes food and beverage, convenience retail, specialty retail and concessions support space throughout the Airport. In general, the potential commercial demand at an airport is driven by annual enplanement demand. Concession demand is expressed in many ways, however, for this study, the amount of space (SF) per 1,000 enplanements was used for each concession type. The assumptions for space per 1,000 enplaned passengers for each concession type was taken from a previous in-terminal concession study conducted for the Airport in 2019.

Concession space requirements for pre and post-security concessions can be found in **Table 3-15** and **Table 3-16**.

Table 3-15: Pre-Secure Concessions Requirements

Pre-Secure Concessions							
	Unit	**Existing**	**2022**	**PAL[1] 1**	**PAL 2**	**PAL 3**	**PAL 4**
Annual Enplanements		1,500,618	1,500,618	1,980,000	2,330,000	2,725,000	3,157,000
% of Total Concessions Program Pre-Security	20%						
Food and Beverage (F&B)	8.6 SF/1K Enplanements	460	2,600	3,500	4,100	4,700	5,500
Specialty Retail	2.0 SF/1K Enplanements	284	700	800	1,000	1,100	1,300
Convenience Retail	2.1 SF/1K Enplanements	Incl.	700	900	1,000	1,200	1,400
Pre-Secure Concession Storage	15% of F&B, 20% of CR, 15% of SR	6,916	700	800	1,000	1,200	1,300
Total Area for Pre-Secure Concessions		7,660	4,700	6,100	7,100	8,200	9,500
1 PAL: Planning Activity Level							

Source: *Mead & Hunt, 2023.*

Table 3-16: Post-Secure Concessions Requirements

Post-Secure Concessions							
	Unit	**Existing**	**2022**	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**
Annual Enplanements		1,500,618	1,500,618	1,980,000	2,330,000	2,725,000	3,157,000
% of Total Concessions Program Post-Security	80%						
Food and Beverage (F&B)	8.6 SF/1K Enplanements	9,777	10,330	13,700	16,100	18,800	21,800
Specialty Retail	2.0 SF/1K Enplanements	2,003	2,500	3,200	3,800	4,400	5,100
Convenience Retail	2.1 SF/1K Enplanements	1,847	2,600	3,400	4,000	4,600	5,400
Post-Secure Concession Storage	15% of F&B, 20% of CR, 15% of SR	2,570	2,500	3,300	3,800	4,400	5,200
Total Area for Post-Secure Concessions		14,350	17,930	23,600	27,700	32,200	37,500
1 PAL: Planning Activity Level							

Source: *Mead & Hunt, 2023.*

Restrooms

Programming for restroom spaces consists of defining the space required to accommodate demand for men's and women's fixtures, family restrooms, service janitor closets, and mother's nursing stations. Programming for restroom facilities at PSP followed guidance from ACRP Report 226: *Guidebook for Airport Terminal Restroom Planning and Design*. The results of the analysis are shown in **Table 3-17** and **Table 3-18**.

Table 3-17: Pre-Secure Restroom Requirements

Pre-Secure Restrooms						
	Existing	2022	PAL 1	PAL 2	PAL 3	PAL 4
Total Peak Hour O&D Passengers	2,647	2,647	2,712	3,021	3,343	3,157,000
Visitor Ratio	1.10					
Design Demand	-	2,912	2,983	3,323	3,677	4,117
Total Male Fixtures	15	13	14	15	17	19
Total Female Fixtures	8	17	17	19	21	24
Total Area for Pre-Secure Restrooms	1,734	4,200	4,400	4,800	5,400	6,100
1 PAL: Planning Activity Level						

Source: *Mead & Hunt, 2023.*

Table 3-18: Post-Secure Restroom Requirements

Post Secure Restrooms						
	Existing	2022	PAL 1	PAL 2	PAL 3	PAL 4
Total Peak Hour O&D Passengers	2,647	2,647	2,712	3,021	3,343	3,157,000
Peak 20-Minutes Passenger Demand	45% of Peak Hour					
Design Demand	60%					
Total Male Fixtures	23	25	25	28	31	35
Total Female Fixtures	23	32	32	35	39	44
Total Area for Post-Secure Restrooms	4,832	8,000	8,000	8,900	9,800	11,100
1 PAL: Planning Activity Level						

Source: *Mead & Hunt, 2023.*

Circulation

Adequate circulation is critical to move passengers from one functional area to the next in an efficient and comfortable manner. Often times, circulation is based on available space created by another functional area or constraint such as concourse width or limited area adjacent to a check-in or passenger security screening functions due to changes in processes over the years. Circulation is typically split into two areas: secure and non-secure. Minimum clear circulation widths for public areas are 20-feet between major functional elements such as check-in. For a double-loaded concourse, 20-feet minimum is recommended.

For non-public areas, such as back of house spaces, office space, etc. the width should be determined by the function (i.e., moving supplies in a corridor near a loading dock) life safety/egress, accessibility, and local building codes. Assumptions for circulation are as follows:

- **Public Circulation:** 30 percent of all public-serving space including pre-secure concessions, pre-secure restrooms, baggage claim, baggage service offices, check-in area, rental car offices, security screening checkpoint, and meeting and greeting areas.
- **Non-Public Circulation:** 30 percent of all non-public space including airline ticket offices, administrative offices, back-of-house concessions areas, and the Airport support spaces.
- **Vertical Circulation:** two percent of all gross space.

Support and Building Systems

Support functions, such as operations, maintenance and building systems are typically based on a percentage of the overall facility or incremental growth throughout the planning period based on passenger growth. For these areas, the following percentages were applied:

- **TSA Administrative Space**: 15 percent of all TSA passenger screening and baggage screening space
- **Operations and Maintenance Space**: three percent of all gross space
- **Airport Administrative Space**: An assumption was made that staff would increase with growing passenger activity. The amount of space to accommodate that staff was assumed to be four percent of total space.
- **Building Systems and Utilities:** 12.8 percent of all gross space.

Terminal Facility Requirement Summary

The terminal space requirements are summarized in **Table 3-19** with totals at the bottom of the table. Initial terminal development alternatives in the following chapter will use these square footage recommendations as guidelines and targets, however, the alternatives may not exactly achieve the program square footage requirements.

Table 3-19: PSP Terminal Facility Requirements

Terminal Functions	Units	Terminal Requirements					
		Existing	2022	PAL 1	PAL 2	PAL 3	PAL 4
Annual Enplanements		1,500,618	1,500,618	1,980,000	2,330,000	2,725,000	3,157,000
Total Peak Hour Enplanements		1,589	1,589	1,727	1,748	2,008	2,163
Total Peak Hour Deplanements		1,638	1,638	1,773	1,908	2,224	2,567
Check-In Hall							
Full-service counter positions	EA	51	48	55	57	61	65
Check-in area (includes active check-in)	SF	3,008	2,400	2,700	2,800	3,000	3,200
Check-in queue area	SF	5,923	6,500	7,500	7,700	8,300	8,800
Kiosks positions	EA	24	12	13	14	19	20
Kiosks footprint area	SF	-	500	600	600	800	800
Bag-drop position	EA	10	10	14	16	20	24
Bag-drop position area	SF	-	500	700	800	1,000	1,200
Bag-drop queuing area	SF	-	900	1,200	1,300	1,700	2,000
Airline ticket office area	SF	6,242	8,000	8,600	8,600	9,200	9,800
Subtotal	**SF**	**15,173**	**18,800**	**21,300**	**21,800**	**24,000**	**25,800**
Outbound Baggage Screening and Baggage Make-up							
Number of Level 1 EDS units	EA	5	4	4	4	4	4
Level 1 EDS area	SF	(incl.)	12,000	12,000	12,000	12,000	12,000
Number of Level 2 OSR stations	EA	2	2	2	2	3	3
Level 2 OSR area	SF	(incl.)	400	400	400	600	600
Number of Level 3 ETD units	EA	(incl.)	3	3	3	4	4
Level 3 ETD area	SF	(incl.)	450	450	450	600	600
TSA baggage screening room	SF	8,896	22,500	22,500	22,500	23,100	23,100
Outbound baggage make-up area	SF	26,300	29,250	29,250	29,250	29,250	39,000
Subtotal	**SF**	**35,196**	**51,750**	**51,750**	**51,750**	**52,350**	**62,100**
Security Screening Checkpoint							
Checkpoint lanes	EA	6	7	7	7	8	10
Checkpoint screening area	SF	7,034	13,300	13,300	13,300	15,200	19,000
Checkpoint queue area	SF	5,500	4,200	4,200	4,200	4,800	6,000
Checkpoint exit lane	SF	1,000	1,400	1,400	1,400	1,600	2,000
U.S. Customs Border and Protection	SF	-	18,000	20,000	20,000	20,000	20,000
Subtotal	**SF**	**13,534**	**36,900**	**38,900**	**38,900**	**41,600**	**47,000**
Departure Lounge							
Gates	EA	18	20	23	24	27	32
Departure Lounge	SF	29,242	71,200	82,320	85,880	96,560	114,800
Subtotal	**SF**	**29,242**	**71,200**	**82,320**	**85,880**	**96,560**	**114,800**
Baggage Claim and Inbound Baggage Handling							
Number of carousels	EA	3	3	4	4	4	5
Claim area (carousels)	SF	11,391	17,400	23,200	23,200	23,200	29,000
Baggage service offices	SF	697	840	980	980	1,120	1,260
Inbound baggage offload area	SF	1,920	10,500	14,000	14,000	14,000	17,500
Subtotal	**SF**	**14,008**	**28,740**	**38,180**	**38,180**	**38,320**	**47,760**

Terminal Functions	Units	Terminal Requirements					
		Existing	2022	PAL 1	PAL 2	PAL 3	PAL 4
Annual Enplanements		1,500,618	1,500,618	1,980,000	2,330,000	2,725,000	3,157,000
Total Peak Hour Enplanements		1,589	1,589	1,727	1,748	2,008	2,163
Total Peak Hour Deplanements		1,638	1,638	1,773	1,908	2,224	2,567
Concessions							
Pre-secure Concessions							
Food & Beverage	SF	460	2,600	3,500	4,100	4,700	5,500
Retail	SF	284	1,400	1,700	2,000	2,300	2,700
Concessions Support and Storage	SF	6,916	700	900	1,000	1,200	1,300
Post-secure Concessions							
Food & Beverage	SF	9,777	10,330	13,700	16,100	18,800	21,800
Retail	SF	3,972	5,100	6,600	7,800	9,000	10,500
Concessions Support and Storage	SF	2,570	2,500	3,300	3,800	4,400	5,200
Rental car Concessions							
Rental car offices	SF	2,029	-	-	-	-	-
Queuing area	SF	2,330	-	-	-	-	-
Subtotal	**SF**	**28,338**	**22,630**	**29,700**	**34,800**	**40,400**	**47,000**
Restrooms							
Pre-security men fixtures	fixtures	15	13	14	15	17	19
Pre-security women fixtures	fixtures	6	17	17	19	21	24
Pre-security restroom area	**SF**	**1,721**	**4,200**	**4,340**	**4,760**	**5,320**	**6,020**
Post-security men fixtures	fixtures	23	25	25	28	31	35
Post-security women fixtures	fixtures	23	32	32	35	39	44
Post-security restroom area	**SF**	**4,832**	**7,980**	**7,980**	**8,820**	**9,800**	**11,060**
Non-public restrooms	SF	1,973	3,246	4,295	5,044	5,918	6,842
Mother's nursing stations	SF	90	270	270	270	270	360
Animal service relief area	SF						Included in Outdoor Space
Subtotal	**SF**	**8,616**	**15,696**	**16,885**	**18,894**	**21,308**	**24,282**
	Total men fixtures	**38**	**38**	**39**	**43**	**48**	**54**
	Total women fixtures	**29**	**49**	**49**	**54**	**60**	**68**
Support Functions							
TSA administration and staff support	SF	6,025	6,000	6,000	6,000	6,500	7,300
Operations and maintenance	SF	7,606	10,000	13,200	15,600	18,300	21,300
Airport administrative areas	SF	7,901	13,000	17,200	20,200	23,700	27,400
Lounge/Play Area/Additional Seating	SF	10,326	10,326	13,200	13,800	15,500	18,400
Subtotal	**SF**	**31,858**	**39,326**	**49,600**	**55,600**	**64,000**	**74,400**
Circulation							
Pre-security public circulation	SF	19,725	32,000	37,900	39,400	42,500	49,200
Post-security public circulation	SF	51,707	42,600	50,000	53,500	59,800	69,300
Non-public circulation	SF	10,426	24,990	28,440	30,060	33,000	37,620
Vertical circulation	SF	3,442	3,500	8,900	9,400	10,300	12,000
Subtotal	**SF**	**85,300**	**103,090**	**125,240**	**132,360**	**145,600**	**168,120**
Other Areas							
Building Systems and Utilities	SF	38,841	49,700	58,100	61,300	67,100	78,300
Subtotal	**SF**	**38,841**	**49,700**	**58,100**	**61,300**	**67,100**	**78,300**
TOTAL AREA	**SF**	**300,106**	**437,900**	**512,000**	**539,500**	**591,300**	**689,600**
Estimated surplus/deficiency (-) compared with existing facility			**-137,800**	**-211,900**	**-239,400**	**-291,200**	**-389,500**

Source: *Mead & Hunt, 2023.*

LANDSIDE GROUND TRANSPORTATION REQUIREMENTS

Introduction

This analysis uses the FAA approved forecasts of enplaned passengers from the previous chapter and focuses on vehicle roadway access and circulation, the terminal curbside, pedestrian infrastructure, transit access, and four primary parking components found in the immediate terminal area. These components include public, employee, rental, and taxi/commercial vehicles.

Terminal Curb Front

The terminal curb front requirements are derived from the Design Day Flight Schedules (based on the current day, March 6, 2023, maximum day) for the high growth scenario at four Planning Activity Levels (PAL) with PAL 4 representing the 2042 horizon year scheduled flights and PALs 1- 3 intermediate years that trigger different schedule patterns. For each PAL, the seat capacity for each flight is multiplied by the expected passenger load factor[1] to estimate the number of passengers arriving or departing by their scheduled arrival or departure times. The flights and passenger demand by PAL are shown in **Table 3-20**.

Table 3-20: Design Day Flight and Passenger Demand Summary

	PAL 1	PAL 2	PAL 3	PAL 4
Arriving				
Flights	79	91	106	122
Passengers	8,455	10,078	11,838	13,709
Departing				
Flights	79	91	106	122
Boarding	8,455	10,078	11,838	13,709
Total				
Flights	158	182	212	244
Enplanements	16,909	20,156	23,675	27,417

Source: *Mead & Hunt, 2023.*

As described in the following sections the following steps were conducted to determine the Landside Requirements:

- The passengers arriving and departing at the curbside are determined from their scheduled gate arrivals and departure times based on the times it takes to rent/return cars, park, check/claim bags/ticketing, go through security and customs and travel through the Airport and deplane or

[1] Load factors vary from 0.72 – 0.90 (with 2 International Flights set at 0.49 - 0.52)

board the aircraft. Time is added for arriving passengers (lag time) and it is subtracted for departing passengers (lead time).

- Based on this curbside demand by time of day the peak hour is selected.
- The distribution of curbside passengers by mode of arrival/departure is then estimated based upon historical values and expected changes in the future.
- Curbside Requirements and Levels of Service (LOS) are then estimated using the Airport Cooperative Research Program (ACRP) Report 40 Quick Analysis Tool for the Airport Roadways (QATAR) Workbook and the existing/planned curbside characteristics. To derive the requirements adjustments to Curb lengths and other inputs are made until LOS C design goals are met.
- These are then used as inputs for the circulation and mobility planning and landside plans for travel to/from/ and within the Airport grounds.

Curbside Passenger Demand

Curbside demand by time of day is determined by adjusting scheduled arrivals and departures by the time it takes to arrive and depart by passenger segment. The passenger segments used for this analysis and associated assumptions are:

- Check Baggage/ticketing counter = 61 percent domestic, 80.5 percent international
- Rent a car on site = 23 percent
- Rent a car off site = 1 percent
- Pre-check security = 45 percent
- Percent of international versus domestic based on flight origin/destination

These are combined for each passenger to create passenger scenarios (e.g. a passenger may rent a car on site, check a bag, use pre-check security, and then arrive at the gate 30 minutes before departure to be in time for boarding) and the time it takes to carry out each activity for the scenario summed: For arrivals, time is added to the scheduled arrival time, and for departures time is subtracted from the scheduled departure time. These Lag and Lead times are shown in **Table 3-21** and in **Table 3-22**. An additional calculation is also provided for those that are driving and parking at the Airport to estimate when they enter the Airport property and must circulate to the parking entrances, find parking, unload, and travel to the curbside. This is needed later in the process to determine roadside level of service.

Table 3-21: Lag and Lead Time for Scheduled Arrivals and Departures (Minutes Added to Scheduled Arrival Time)

Name	Peak	Off Peak
Disembark	15	15
Customs	20	15
Gate to Out	5	5
Baggage	20	20
Out to Curb	5	5
Rental Process	30	15
Curb Pickup	5	5
Curb to Park	5	5

Source: *Mead & Hunt, 2023.*

Table 3-22: Lag and Lead Time for Scheduled Arrivals and Departures (Minutes Subtracted from Time)

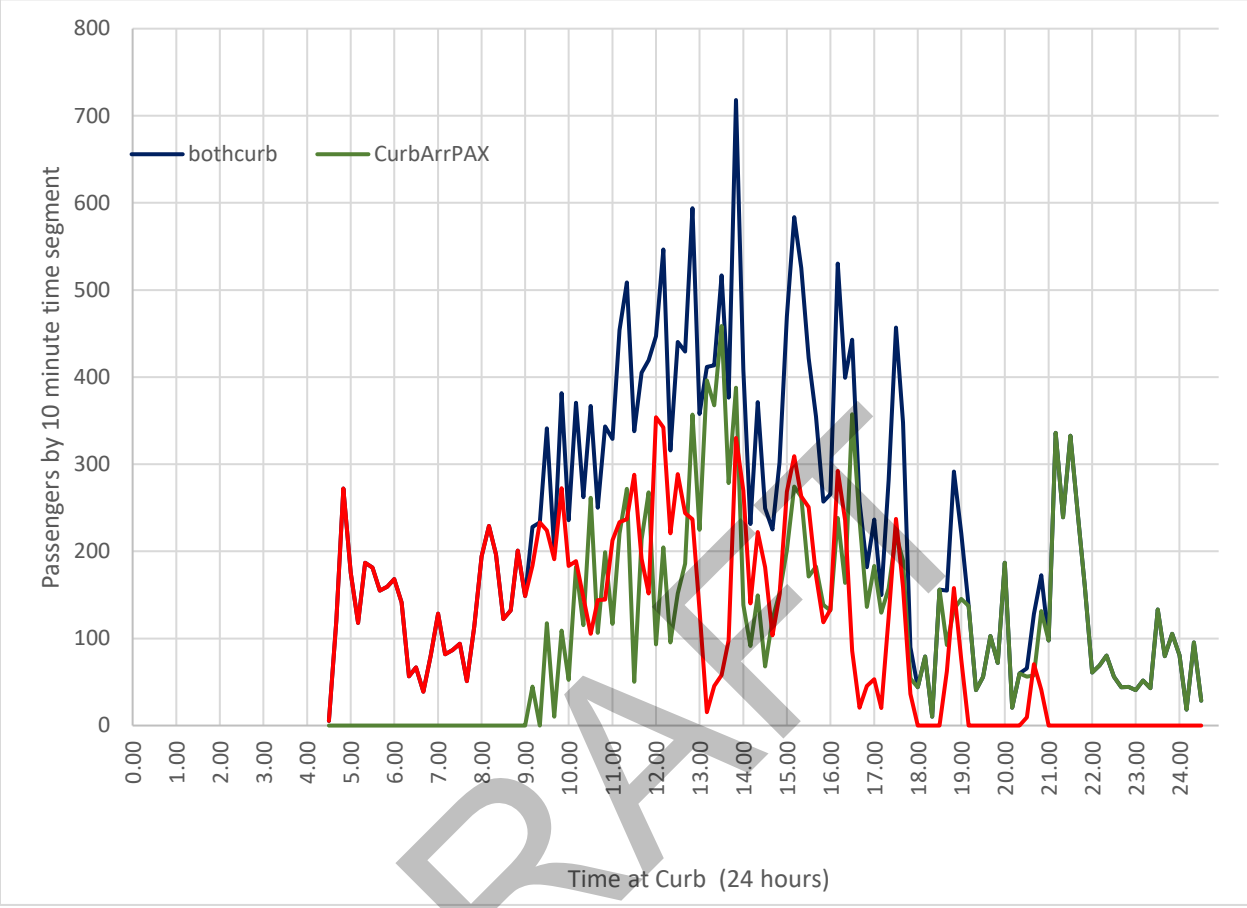
Name	Peak	Off Peak
Rental Return	10	5
Curb to Security	5	5
Baggage Check	20	10
Pre-Check	15	7
No Pre-Check	30	15
Security to Gate	5	5
Gate Arrival to Departure	30	30

Source: *Mead & Hunt, 2023.*

The passengers at the curbside are then aggregated by 10-minute time segments and the arrival and departure passenger demands combined to provide the total passenger demand by time of day at the curbside. The curbside peak hour is then selected from this distribution. For the high demand PAL 4 scenario this was found to be from 12:00 to 13:00 Pacific Standard Time (PST).

Figure 3-11 shows the distribution of passengers arriving, departing, and combined at the curbside in 10-minute time segments. As can be seen, the overall passenger demand at the curbside shifts to earlier in the day and later in the day than the scheduled times, and is more spread out with the earliest departing passengers reaching the curbside between 4 and 5 am in order to ensure that they make their departing flights, and passengers from arriving flights arriving before midnight reaching the curbside after midnight due to the time it takes to disembark, travel through the airport, retrieve baggage, etc.. The peak 10-minute time segment is 720 passengers. It is interesting that the peak hour curbside demand (between Noon and 1 pm) demand at the curb is fairly regular averaging 450 passengers per 10 minute segment, while the max 10 minute segment comes a little bit after the peak hour (at 1:50 to 2:00 pm).

Figure 3-11: Passenger Arrivals and Departure at Curbside by 10-minute Time Segment



Source: *Mead & Hunt, 2023.*

Mode Split and Passenger Volume Development for QATAR Analysis

The overall peak hour passenger volumes shown in **Table 3-23** are then converted to different vehicle demands for input into the QATAR process. The previous Master Plan for PSP included a survey that relayed the vehicular mode split at the curbside. This mode split, along with passenger occupancy levels obtained from ACRP-40, were used to create an estimate of the passenger demand mode split at the curbside for the Palm Springs Airport and can be seen in **Figure 3-12.**

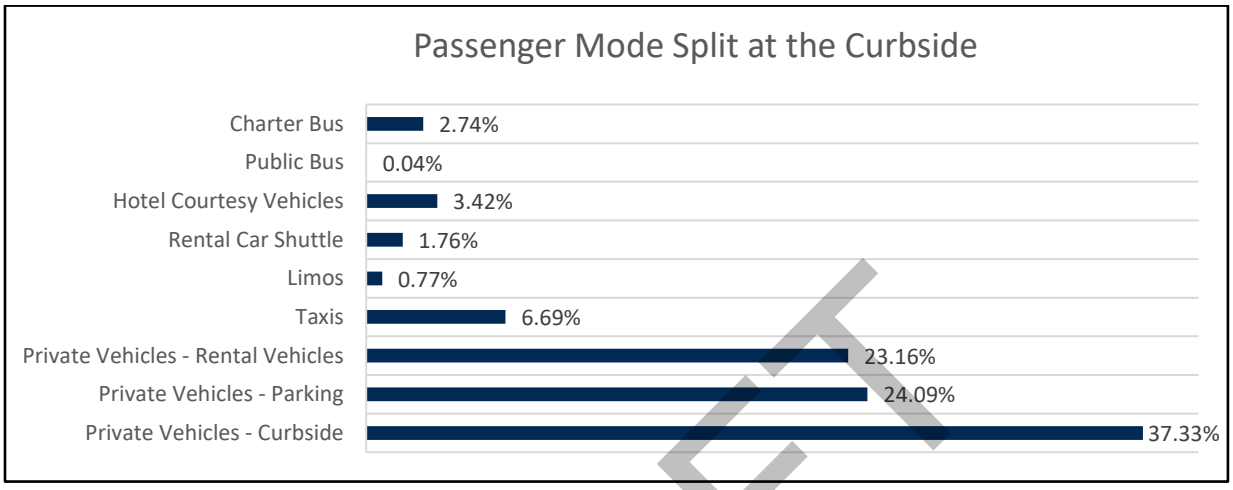
Table 3-23: Peak Hour Passenger Volumes

Passenger Type	Existing Hourly Design Volume	PAL 4 Hourly Design Volume
Departures Facility	1,075	1,800
Arrivals Facility	1,325	2,100
Mixed Traffic Facility	**1,700**	**2,900**

Source: *Mead & Hunt, 2023.*

Figure 3-12 shows that private auto is the dominant mode at the Airport, with all three forms of private vehicle motorists totaling almost 85 percent of all passengers. The remaining 15 percent is split between all other modes, such as transit, taxi and ride-hail services, and hotel shuttle vehicles.

Figure 3-12: Passenger Mode Splits at Curbside



Source: *Mead & Hunt, 2023.*

The passenger mode splits were then applied to the total passenger demand volumes for each of the Planning Activity Level Scenarios (PAL 1-4) and tabulated. All the volumes from this process are depicted in **Table 3-24** for the Inner Curb, and **Table 3-25** for the Outer Curb.

Table 3-24: Vehicular Volumes for PSP Inner Curb

	Existing	PAL 1	PAL 2	PAL 3	PAL 4
Mode					
Private Vehicles - Curbside	530	610	695	770	900
Private Vehicles – Circulating	125	140	160	180	210
Rental Vehicles – Curbside	45	55	60	65	80
Rental Vehicles – Circulating	140	155	180	200	230
Taxis	25	30	35	35	45
Limos	8	8	8	11	11
Charter Bus	5	5	5	5	5
Total	**878**	**1,003**	**1,143**	**1,266**	**1,481**

Source: *Mead & Hunt, 2023.*

Table 3-25: Vehicular Volumes for PSP Outer Curb

	Existing	PAL 1	PAL 2	PAL 3	PAL 4
Mode					
Private Vehicles – Circulating	80	95	110	120	140
Taxis	50	50	65	75	85
Limos	2	2	2	4	4
Shuttles	5	10	10	10	15
Courtesy Vehicles	20	25	30	35	40
Delivery Vehicles	10	10	15	15	20
Total	**167**	**192**	**232**	**259**	**304**

Source: *Mead & Hunt, 2023.*

Curbside Analysis

The vehicular volumes developed in the last section are used as inputs and are entered into the Quick Analysis Tool for the Airport Roadways (QATAR) spreadsheet. The QATAR spreadsheet uses the entering vehicle volumes depicted in **Table 3-24**, and **Table 3-25**, along with assumed curbside dwell times, and geometric characteristics such as number of parking, double parking lanes, and through lanes to determine the Level of Service (LOS) of the terminal curbside.

The QATAR analysis of the existing curbside includes seven curbside zones (three active, four crosswalk). The current linear feet of curb both for the inner roadway, and outer roadway facility is approximately 830 feet in length. The explanation of the curbside zones is important because QATAR is sensitive not only to the length of the curbside zones utilized, but also to how the vehicular volumes are assigned. Google Aerial Imagery was consulted to accurately depict not only the existing curb lengths for the terminal, but to also identify important signage that relays where certain types of vehicles park, and how they are allowed to circulate throughout the Airport roadways. These unique characteristics for the Palm Springs Airport were consulted and used to assign the volumes developed in **Table 3-24**, and **Table 3-25** to one of the three active curbside zones for all scenarios analyzed.

Once the volumes were assigned, the QATAR analyses were run for the existing and PAL 1-4 scenarios. The results of these analyses are depicted in **Figure 3-13** for the Inner Curb, and **Figure 3-14** for the Outer Curb. The QATAR results are also tabulated in **Table 3-26** and **Table 3-27**.

In **Table 3-26** and **Table 3-27**, the terms “Circulating LOS” and “Curbside LOS” are utilized. The Circulating LOS refers to the outer lanes of the Airport road that are meant to service through-traffic to non-curb related uses of the Airport like parking and rental car facilities, as well as moving motorists away from the Airport and back to the regional roadway network. The Curbside LOS, refers to the two lanes closest to the curb, where most of the pick-up and drop-off actions for Airport passengers occurs. The distinction is important because a deficiency in one section of the road, may have different remedies than a deficiency in the other.

Table 3-26: Terminal Curbside Zone Performance (Inner Roadway Facility)

Inner Roadway Facility					
	Existing	PAL 1	PAL 2	PAL 3	PAL 4
Number of Ped Crossings	4	4	4	4	4
Number of Active Zones	3	3	3	3	3
Number of Failing Zones	3	3	3	3	3
Hourly Design Volume	878	1,003	1,143	1,266	1,481
Circulating LOS	D	E	E	F	F
Curbside LOS	A	C	C	D	D

Source: *Mead & Hunt, 2023.*

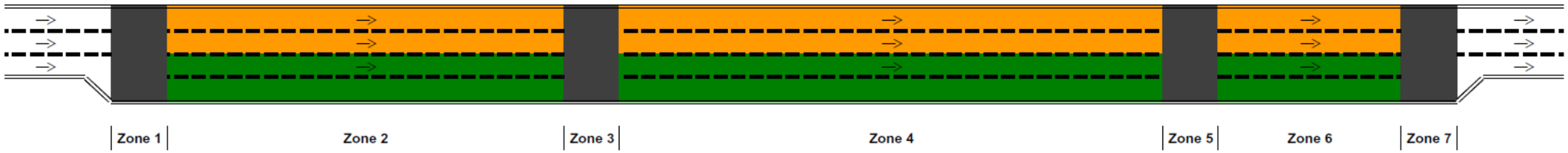
Table 3-27: Terminal Curbside Zone Performance (Outer Roadway Facility)

Outer Roadway Facility					
	Existing	PAL 1	PAL 2	PAL 3	PAL 4
Number of Ped Crossings	4	4	4	4	4
Number of Active Zones	3	3	3	3	3
Number of Failing Zones	0	0	0	0	0
Hourly Design Volume	167	192	232	259	304
Circulating LOS	A	A	A	A	A
Curbside LOS	A	A	A	A	A

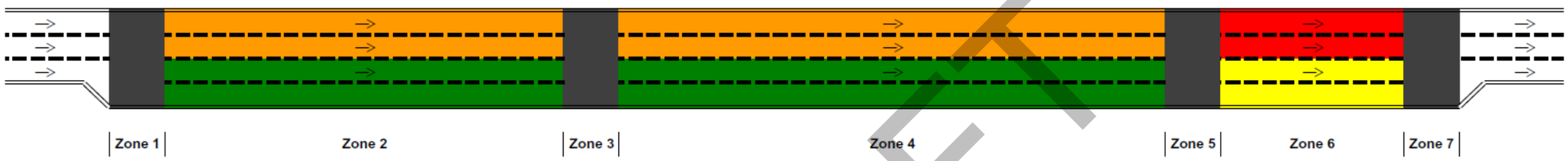
Source: *Mead & Hunt, 2023.*

Figure 3-13: QATAR Results for Inner Curb

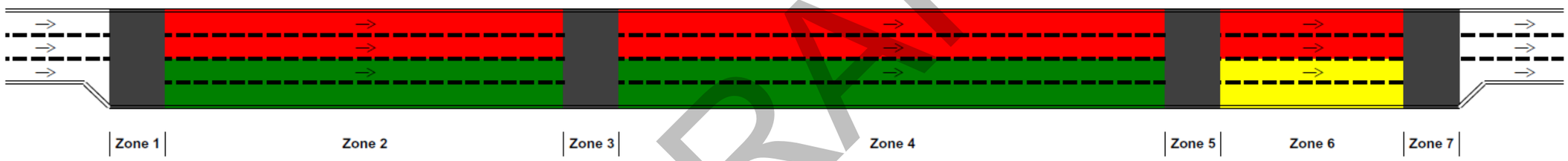
Existing



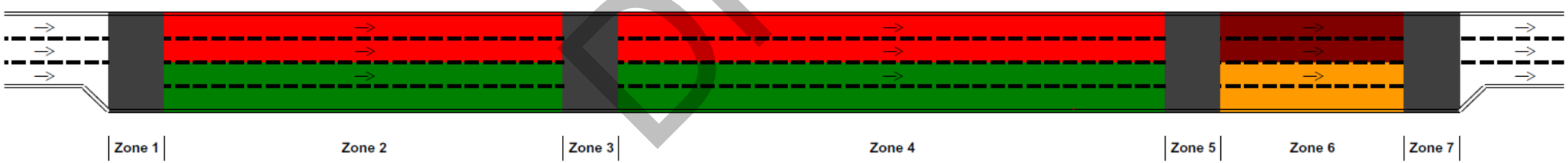
PAL 1



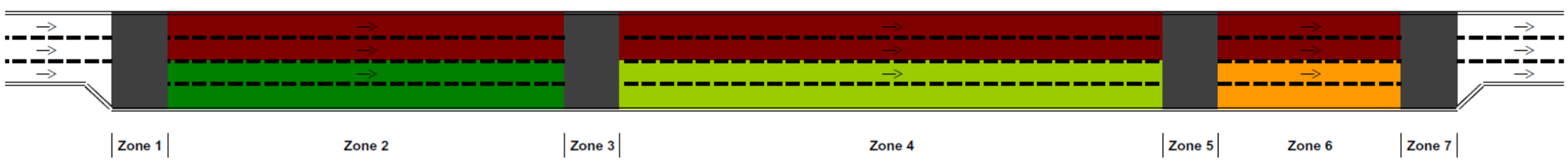
PAL 2



PAL 3



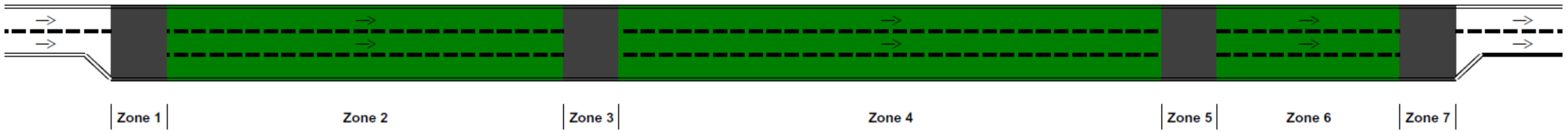
PAL 4



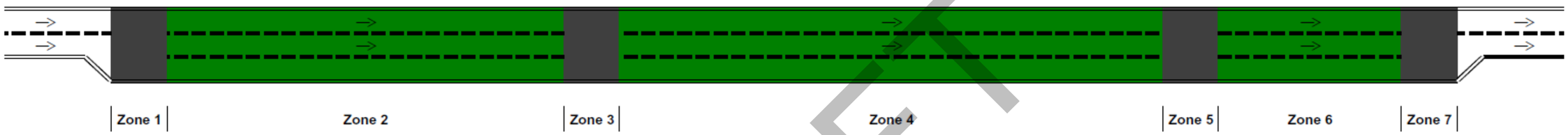
Source: *Mead & Hunt, 2023.*

Figure 3-14: QATAR Results Outer Curb

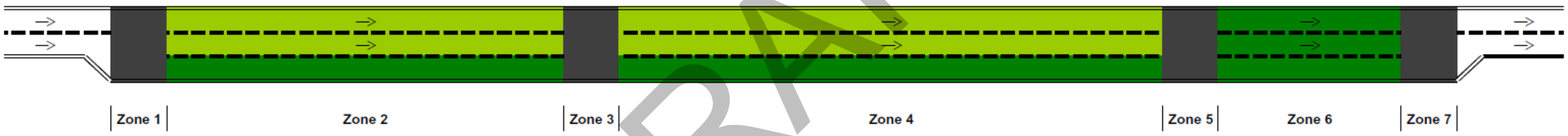
Existing



PAL 1-3



PAL 4



Source: *Mead & Hunt, 2023.*

Curb Extensions were explored, along with the vehicular volumes developed in the PAL 4 scenario, and after 3 iterations (575-foot extension, 1200-foot extension, 650-foot extension with curb zone consolidation), the poor roadway performance could still not be fixed from curb lengthening alone. The anticipated problem in the future will be due to the number of vehicles being routed through the Airport road and is a capacity/volume-related problem. Therefore, alternative scenarios that aim to address the anticipated performance problems in the future should focus on either improving roadway capacity (i.e., adding travel lanes) or decreasing the number of vehicles that traverse the Airport road (i.e., re-routing rental vehicles to regional roadways, shifting parking locations, etc.).

Pedestrian Facilities

Sidewalks & Pedestrian Crossings

Within the terminal area there is a mix of sidewalks that run along the major regional roadways, and crosswalks along the legs of key intersections. There is continuous sidewalk in both directions for all regional roadways within the study area, except for Kirk Douglas Way. There are also visible unmarked crosswalks for all legs of key intersections except for the east leg of the El Cielo Rd & Kirk Douglas Way/El Baristo Rd intersection.

PARKING AND RENTAL CAR FACILITY REQUIREMENTS

Per Chapter 1 – *Inventory of Existing* Conditions, in 2022 PSP reached a peak of 1.5 million enplanements. In the first four months of 2023, PSP has had higher numbers of monthly enplanements than the previous year when looking at a month-to-month comparison, showing that it is on track to see more enplanements in 2023 than in the previous year. By 2042, PSP is projected to reach between 2.5 and 3.2 million enplanements. This section describes how the forecasted growth in commercial passengers could impact automobile public parking demand, employee parking demand, and rental car needs through 2042 at PSP. The facilities addressed in this section include general public parking, employee parking, and rental car parking facilities.

Parking is often the first and last impression that customers and visitors have of their travel experience through an airport, and because public parking is an important revenue source for the operation and maintenance of the Airport, it is critical to maintain appropriate facilities. Planning for parking facilities that meet the needs of PSP's customers is an important endeavor that requires an understanding of current facility requirements and whether they are adequate to serve future demand.

Existing Public Parking Demand

Hourly parking transaction data and overnight occupancy counts provided by the Airport's parking operator were analyzed to determine the current on-site demand for public parking at PSP. Parking data were provided for the period spanning December 6, 2022, through May 31, 2023. Based on previous

passenger activity data, this is the busier period of the year and captures the peak month with respect to enplanements.

Existing (Baseline) Parking Demand

Table 3-28 provides a summary of the parking demand statistics provided for the public parking lots (main and overflow), cell phone lot, and TNC staging lot, organized by month. The 95th percentile column represents roughly the 2nd busiest day of each month; for the full year, the 95th percentile would exclude roughly the 12 busiest days per year.

Utilizing the hourly parking transaction data and overnight parking counts, we extracted occupancy numbers from the transactions and identified the peak hour for each day. We then calculated the 95th percentile based on the peak hour of each day in the 6-month survey period.

Table 3-28: Current Inventory of Parking Spaces per Lot

Year	Month	Avg. Peak Hour Demand	95th Percentile Peak Hour Demand	Absolute Peak Demand
2022	**Dec**	1,042	1,584	1,711
2023	**Jan**	742	876	906
2023	**Feb**	879	1,034	1,166
2023	**Mar**	861	1,009	1,032
2023	**Apr**	927	1,097	1,206
2023	**May**	787	967	1,000
Avg.		**873**	**1,094**	**1,170**

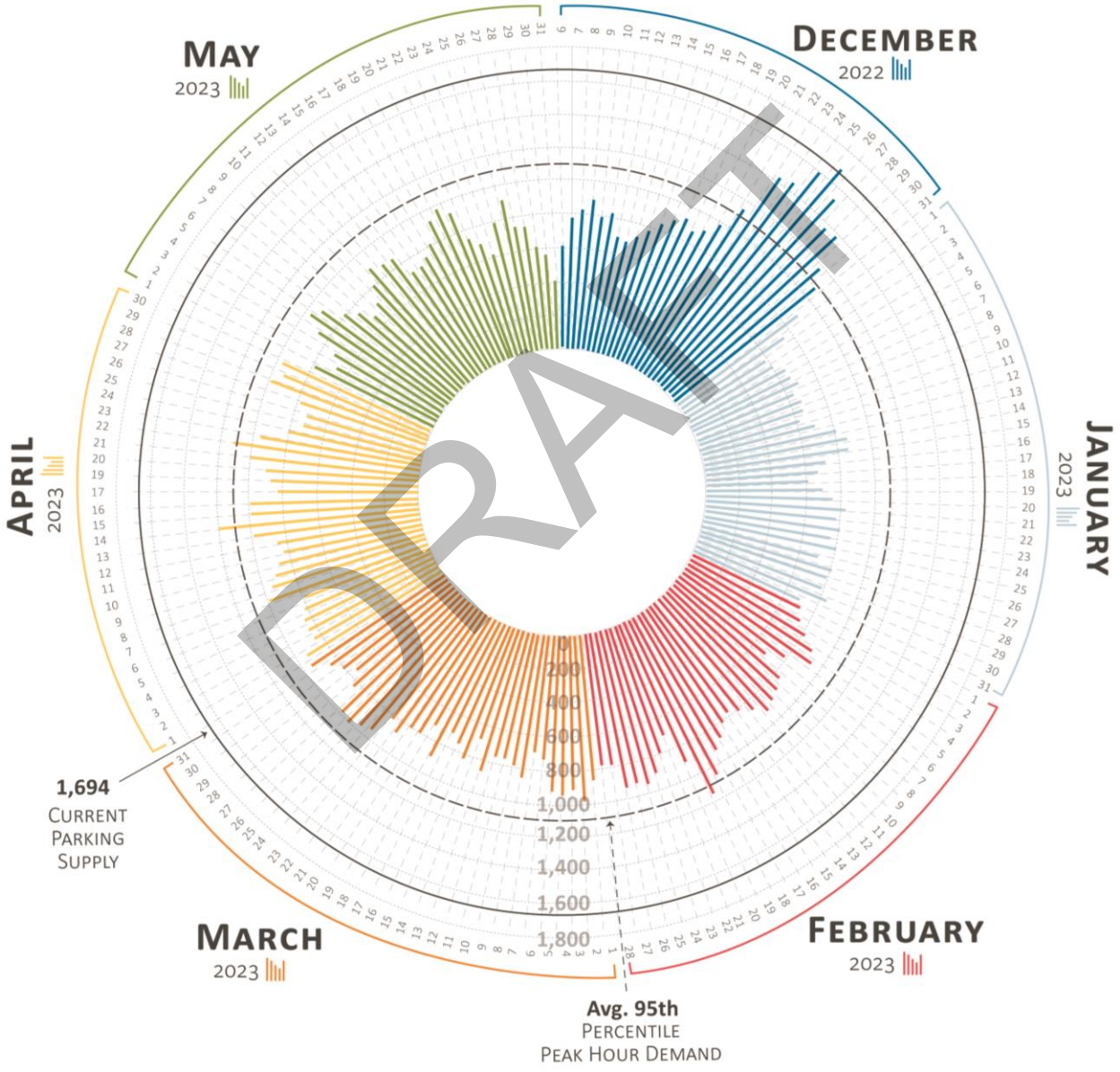
Source: *Walker Consultants, 2023.*

The previous table shows the Average Peak Hour Demand, the 95th Percentile Peak Hour Demand, and the Absolute Peak Demand. Each column is represented as follows:

- Average Peak Hour Demand: To find the average peak hour demand, we first identify the peak hour for each day in the 6-month survey period. We then calculate the average based on those identified peak hour demand numbers for each month. Lastly, an average is calculated based on the monthly average figures. Typically, the average demand is not used for planning a parking system.
- 95th Percentile Peak Hour Demand: To find the 95th percentile, after identifying the peak hour demand for each day, we then calculate the 95th percentile for each month based on each of the identified peak hour demand numbers in the month. We then average the 95th percentile for all months. This average 95th percentile is the design day for the parking system.
- Absolute Peak Demand: The absolute peak demand represents the maximum peak hour demand number for each month. For example, December 26, 2022, had 1,711 cars parked at the peak hour, the highest observed in December 2022. As with the average peak hour, parking systems are typically not designed to the peak value as this tends to result in overbuilding of supply.

Based on the data provided, it appears that PSP experiences the typical spike in parking activity generally around the Christmas holiday, with December 23-27 being the busiest dates. Parking demand throughout the rest of the survey period remains relatively consistent with general upticks between February and April, the historically busy period for commercial enplanements. **Figure 3-15** shows the daily peak hour parking demand for the period between December 6, 2022, and May 31, 2023, and compares it to the current parking supply and average 95th percentile.

Figure 3-15: PSP Monthly Enplanement Trends



Source: *Walker Consultants, 2023.*

As shown in the figure most days in the survey period had peak hour demand that was well below the current supply of 1,694 spaces. The dotted lined circle shows the average 95th percentile of peak hour demand, or the design day. As shown in the figure, the design day is below the peak day, as it is not recommended that a parking system be designed for the peak.

Although it is not shown in the figure, there were only eight (8) nights in the 6-month survey period where the Overflow Lot was not used, meaning that during the survey period the Overflow Lot was used by at least one vehicle during 95.5percent of the days, according to the overnight count data provided by the operator. However, use of the Overflow Lot does not mean that there were no spaces available in the Main Lot. It is likely that some customers are opting to park in the Overflow Lot as it is priced lower than the Main Lot.

Design Day Demand Ratio

Table 3-29 provides a summary of the design day parking ratio, sometimes referred to as the parking demand ratio. To calculate the design day demand ratio, we take the average 95th percentile demand, divide it by the average monthly enplanements for our survey period, and lastly base it on a ratio of 1,000 enplanements by dividing by 1,000. The following table shows the resulting PSP design day demand ratio.

Table 3-29: Calculated Parking Demand Ratios

Lot	Avg. 95th Percentile Demand	Avg. Monthly Enplanements	Demand Ratio (Per 1,000 enplanements)
Public Parking (Overflow Included)	1,094	178,055	6.4

Note: The demand ratio represents a blended average of demand ratios for each individual month and may differ slightly from a simple calculation of the values above (i.e., "Avg. 95th Percentile Demand / Avg. Monthly Enplanements / 1,000)

Source: *Walker Consultants, 2023.*

Projected Future Public Parking Needs

Passenger enplanements at PSP are expected to grow at an average rate of roughly 4.5 percent compounded annually between 2022 and 2032, and 3.1 percent between 2032 and 2042 under a high growth scenario. This analysis is based on the projected peak month passenger enplanement totals, which are calculated based on 2022 monthly enplanement shares.

Table 3-30 provides a projection of public parking needs based on the projected peak monthly enplanements through the horizon year 2042. Recall that the demand ratios have been calibrated to a 95th percentile design day, meaning that some additional parking or operational changes might be needed to accommodate peak loads on the busiest 10 to 12 days per year, assuming these demand totals are realized.

Please note, however, that the following demand totals have been labeled as "unadjusted" meaning that they do not factor in any potential future changes in driving and parking behaviors that may arise due to future changes in policy (such as increased parking rates) or in the operation of the parking system. These factors are discussed briefly in the next section before arriving at a final parking surplus/deficit conclusion for PSP.

Table 3-30: Projected Unadjusted Future Parking Demand

Year	Total Annual Enplanements	*Peak Month Enplanements	Projected Design Day Parking Demand
Existing	1,500,618	202,993	1,289
PAL 1	1,982,000	268,111	1,702
PAL 2	2,329,000	315,051	2,000
PAL 3	2,725,000	368,619	2,340
PAL 4	3,157,000	427,057	2,711
Note: Peak month enplanement projections from 2027 – 2042 are based on 2022 monthly enplanement shares.			

Source: *Walker Consultants, 2023.*

Adjustments to Projected Demand

The long-term outlook for PSP, through 2042, shows a significant potential increase in parking needs to accommodate the projected growth in enplanements under a high growth scenario. Still, adjustments to the demand model are important to consider as described below.

Mode Split Adjustment

Though the self-driving technology of autonomous vehicles (AV) coupled with transportation network company (TNCs) service could have an impact on parking demand at airports in the future, projections for the proliferation of these technologies are variable. In our latest research, the timeline for when we might see material changes in the implementation and use of these technologies goes beyond 2040. As such, for this analysis, we assume no change in the mode split, or in other words no reduction in parking demand due to this technology.

Effective Supply Adjustment

To arrive at the projected surplus/deficit conclusions, a parking supply cushion of seven percent is also factored into the design day need. This adjustment helps to ensure that drivers arriving to the Airport do not find every available stall occupied. This can lead to driver frustration, excess circulation, and "poaching" where drivers sit in the drive aisle and wait for motorists to return to their vehicles.

During busy periods, many airports rely on extra signage and parking attendants to direct motorists to the last available stalls in the main lots and then to overflow lots. Therefore, the seven percent effective supply cushion is reduced during these periods and can help to offset typical variations in travel behaviors from month to month. (However, the 6-12 busiest travel days may still need to rely on remote or overflow parking facilities to add to the total supply.)

Projected Parking Need and Surplus / Deficit

Taking into consideration the effective supply adjustment, it is projected that a total adjusted parking need of up to 2,901 parking stalls for the Airport to support 2042 projections, or 1,207 net new stalls. A summary of the parking facility requirements is shown **Table 3-31**.

Table 3-31: Adjusted Public Parking Need Projection

Year	Projected Design Day Parking Demand (Unadjusted)	Effective Supply Adjustment	Total Adjusted Parking Need	Current Supply	Surplus/ Deficit
Existing	1,289	7%	1,379	1,694	315
PAL 1	1,702	7%	1,821	1,694	-127
PAL 2	2,000	7%	2,140	1,694	-446
PAL 3	2,340	7%	2,504	1,694	-810
PAL 4	2,711	7%	2,901	1,694	-1,207

Source: *Walker Consultants, 2023.*

Allocation of Parking Product Types (Short-Term, Long-Term)

PSP does not currently have a physical separation between short-term and long-term parking lots as the Main Lot serves both types. Instead, the airport uses pricing to distinguish among the different lengths of stay. For example, in terms of short-term parking, the cost is $3 per 20 minutes, and $8 dollars per hour, with a seven (7) minute grace period. In terms of long-term parking, the daily max in the Main Lot is $20 and in the Overflow Lot $18. The price difference effectively serves as the key variance between what would be considered short-term versus long-term parking. In the following section, Walker offers an opinion as to how these two parking types could be allocated at PSP through PAL 4 based on current demand. However, it must be noted that price is and should be the crucial factor in the allocation of parking space types. Demand is a function of price, thus for planning purposes, the airport should not start with a parking supply number based on solely demand, as price is the more appropriate tool for managing a parking system.

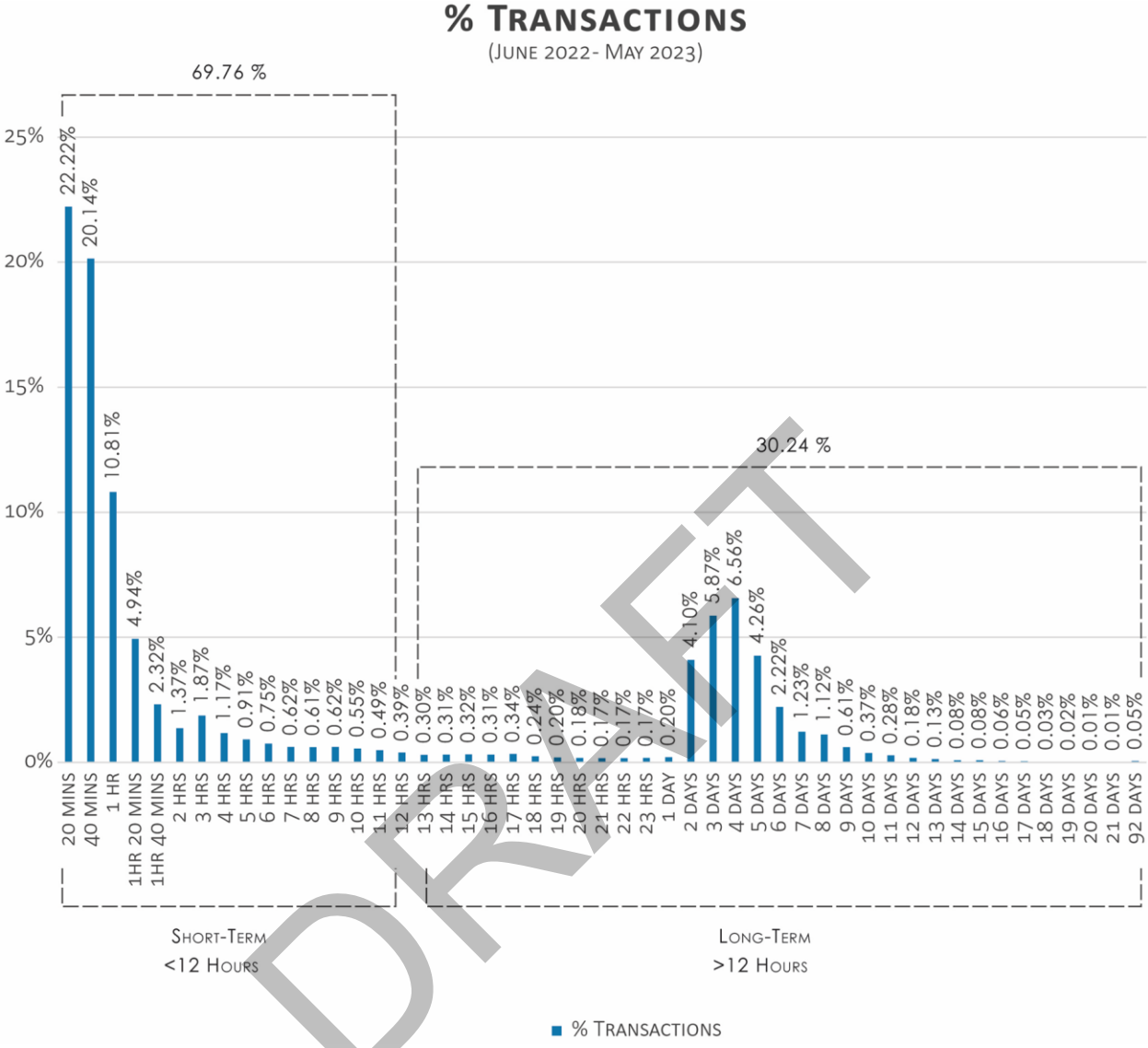
The concept of pricing plays a pivotal role in efficiently allocating the limited parking resources available. Short-term or premium parking spaces should be located in convenient and highly sought-after areas

relative to longer-term parking as a best practice. This parking should therefore command a higher price relative to less convenient parking due to its proximity to desirable destinations, i.e., near the terminal. This pricing strategy helps maximize revenue while ensuring that those willing to pay a premium have access to prime parking spots. On the other hand, long-term or economy parking spaces, offer a more affordable alternative, providing options for individuals seeking cost-effective solutions or are willing to walk a bit farther. By adjusting prices based on location and demand, the Airport can strike a balance between meeting diverse customer needs and generating revenue to support the maintenance and development of parking infrastructure and operations. The amount of parking to provide in short-term and long-term areas should be a function of price, which in turn allows the Airport the flexibility to manage demand and the size of its parking facilities.

Summary of Parking Duration Data

Vehicle parking duration data were provided by the Airport's parking operator for the period spanning June 2022 to May 2023. The following figure shows the percentage of transactions during the survey period (June 2022 – May 2023) that fell within different durations of time.

Figure 3-16: Summary of Parking Duration (June 2022 – May 2023)



Source: *Walker Consultants, 2023.*

As shown in **Figure 3-16**, in this analysis we consider parking durations of 12 hours or less to be short-term parking transactions. The percentage of total parking transactions that were 12 hours or less during the survey period was 69.8 percent. In turn, the long-term transactions accounted for 30.2 percent of all transactions. We note, however, that long-term parking has an outsized impact on the number of spaces needed, due to the longer lengths of stay.

In comparison to the current allocation of parking product types, 53 percent of spaces are in the Main Lot (i.e., Short-Term), while 47 percent are in the Overflow Lot (i.e., Long-Term), resulting in more short-term spaces than long-term spaces. However, it is important to note that parking transactions do not necessarily align with the percentage of short-term and long-term vehicles present during the peak hour.

Projection of Parking Allocation by Product Type (Short-Term versus Long-Term)

The allocation of spaces at PSP is currently weighted toward short-term parking (Main Lot) with 53 percent of the spaces allocated to that product. It is projected that the future split between short-term and long-term parking spaces could remain the same or similar as it is today, primarily because, if the Airport builds additional parking, it is likely to occur near the terminal; thus, replacing the surface parking closest to the terminal with a structure. In doing so, the structured parking should be priced at a premium since those spaces are going to be the most convenient and will also be covered from the sun. Due to the likely expansion of spaces occurring near the terminal, short-term products would likely maintain a higher percentage of the supply. **Table 3-32** shows Walker's projected parking needs based on the high enplanement scenarios and shows the potential split among short-term and long-term parking.

Table 3-32: Projected Future Parking Needs and Short-Term vs. Long-Term Split

Year	Short-Term Parking %	Long-Term Parking %	Projected Short-Term Spaces	Projected Long-Term Spaces	Total Adjusted Parking Need
Existing	53%	47%	731	648	1,379
PAL 1	53%	47%	965	856	1,821
PAL 2	53%	47%	1,134	1,006	2,140
PAL 3	53%	47%	1,327	1,177	2,504
PAL 4	53%	47%	1,538	1,363	2,901

Source: *Walker Consultants, 2023.*

Employee Parking Requirements

Today, there are six (6) parking areas allocated to employees, airport administration, and tenants of PSP. The following figure shows the locations of the current employee, airport administration, and tenant parking areas. Combined, the five parking areas have approximately 331 parking spaces as illustrated in **Figure 3-17**.

Figure 3-17: Employee, Airport Administration, and Tenant Parking Lots

***Source**: Walker Consultants, 2023.*

The following table shows the inventory of current spaces per parking area.

Table 3-33: Employee, Airport Administration, and Tenant Parking Supply (Existing)

Lot	Number of Spaces
Tenant Manager (South of Terminal)	14
Tenant Manager (South of USO)	51
Airport Administration	17
Employee Parking	177
Employee Parking (Dirt Lot)	27
Employee Parking (Overflow)	45
Total	**331**

Source: Walker Consultants, 2023.

Current Employee Parking Demand

Walker received employee parking permit data from the airport's security manager's office. The following table summarizes the allocation of permits among the different employee lots.

Table 3-34: Employee Parking Permit Allocation

Lot	Number of Spaces	Number of Permits Issued
Tenant Manager (South of Terminal)	14	81
Tenant Manager (South of USO)	51	
Airport Administration	17	
Employee Parking	177	1,074*
Employee Parking (Dirt Lot)	27	
Employee Parking (Overflow)	45	
Subtotal (Car Parking)	*331*	*1,155*
Motorcycle Parking	-	25
Total	**331**	**1,180**

*Note: *There are 901 permits are considered general employee parking, and 172 are considered temporary.*

Source: PSP staff, 2023.

As shown in the table, there are more permits (1,180) than there are employee parking spaces (331). It is typical to see an oversell of permits per lot as not all employees will be parked at the exact same time given that there are approximately three different shifts: an early morning shift, a midday shift, and an afternoon shift.

Since not all permits are in use at the same time, to better understand employee parking demand at the peak hour, Walker conducted parking occupancy counts between 10:00 am and 4:00 pm on Monday, May

22, 2023. These data serve as a baseline of current employee parking demand during the peak period of a typical weekday. At the peak hour, 53 percent of all employees, airport administration, and tenant parking spaces were occupied. However, discussions with the airport security manager's office revealed that some employees prefer to park off site in areas adjacent to the airport on the road right of way. We estimate that approximately up to 30 employee vehicles park off site during the peak hour, bringing the total employee occupancy to approximately 63 percent if those offsite vehicles were parked within the existing supply.

The following table shows the occupancy of each area during the peak hour of the survey day with the approximate off-site demand layered onto the total.

Table 3-35: Existing Employee Parking Demand

Lot	Number of Spaces	Peak Hour Occupancy
Tenant Manager (South of Terminal)	14	79%
Tenant Manager (South of USO)	51	29%
Airport Administration	17	53%
Employee Parking	177	70%
Employee Parking (Dirt Lot)	27	67%
Employee Parking (Overflow)	45	0%
Subtotal	*331*	*53%*
Total (with Offsite Demand Added)	**361**	**63%**

Source: Walker Consultants, 2023.

As shown in the previous table, none of the employee parking areas reached capacity during the peak hour. However, given that May is not the busiest month of the year at PSP in terms of passenger activity, we assume a potential increase in employee presence during the peak hour of the busiest passenger months. Per the airport security manager's office, during the busiest part of the year (i.e., March), at the peak hour current employee parking demand nearly reaches capacity. As such, we assume a percentage increase of 40 percent to the observed current employee parking demand. The following table shows the current parking demand adjusted for peak activity.

Table 3-36: Adjusted Employee Parking Demand

Lot	Number of Spaces	Peak Hour Occupancy Adjusted for Seasonality
Tenant Manager (South of Terminal)	14	100%
Tenant Manager (South of USO)	51	41%
Airport Administration	17	74%
Employee Parking	177	98%
Employee Parking (Dirt Lot)	27	93%
Employee Parking (Overflow)	45	93%*

Total	**331**	**88%**

*Note: *This includes the projected offsite demand.*

Source: Walker Consultants, 2023.

When accounting for peak employee presence during the busier periods of the year, the projected existing employee parking demand is approximately 88 percent. This aligns with the airport security manager's observation that existing employee parking supplies are just sufficient in meeting today's demand.

Future Employee Parking Demand

This analysis assumes that the employee growth rate will resemble the enplanement growth rate for the planning horizon. As such, to calculate future employee parking demand, we take the observed parking demand and project growth based on the compound annual growth rate as presented in the forecast chapter. In all, there are three growth scenarios presented: a low, a base, and a high. In this analysis a more conservative approach was taken for projecting employee parking needs through the horizon year, as such the following requirements are shown under the high scenario.

Table 3-37: Projected Future Employee Parking Need

Lot	Adjusted Peak Hour Demand (Existing)	PAL 1	PAL 2	PAL 3	PAL 4
Total Employee Parking	290	361	450	416	610
Supply	331	331	331	331	331
Surplus/Deficit	41	-30	-119	-193	-279

***Source:** Walker Consultants, 2023.*

The results of the analysis shown in **Table 3-37** indicate that in PAL 1, PSP should have sufficient supply to accommodate employee parking demand under a high growth scenario. By 2032, there could be a slight deficit of employee spaces if no changes in supply are made, or parking demand grows unmitigated. The deficit could increase all the way through PAL 4.

However, the projections presented are based on high-level enplanement growth and have not considered specific plans by the Airport to add air carriers, additional gates, or outside services. Thus, employee parking demand projections as presented may not materialize, and in turn could result in adequate facilities beyond PAL 1. Before investing in new permanent parking infrastructure, Walker recommends that the Airport monitor employee parking demand as more employees are added to the parking system.

Also, there are ways to mitigate employee parking demand. This includes transportation demand management (TDM) programming such as carpools, vanpools, public transit passes/incentives, and increasing the cost of parking permits.

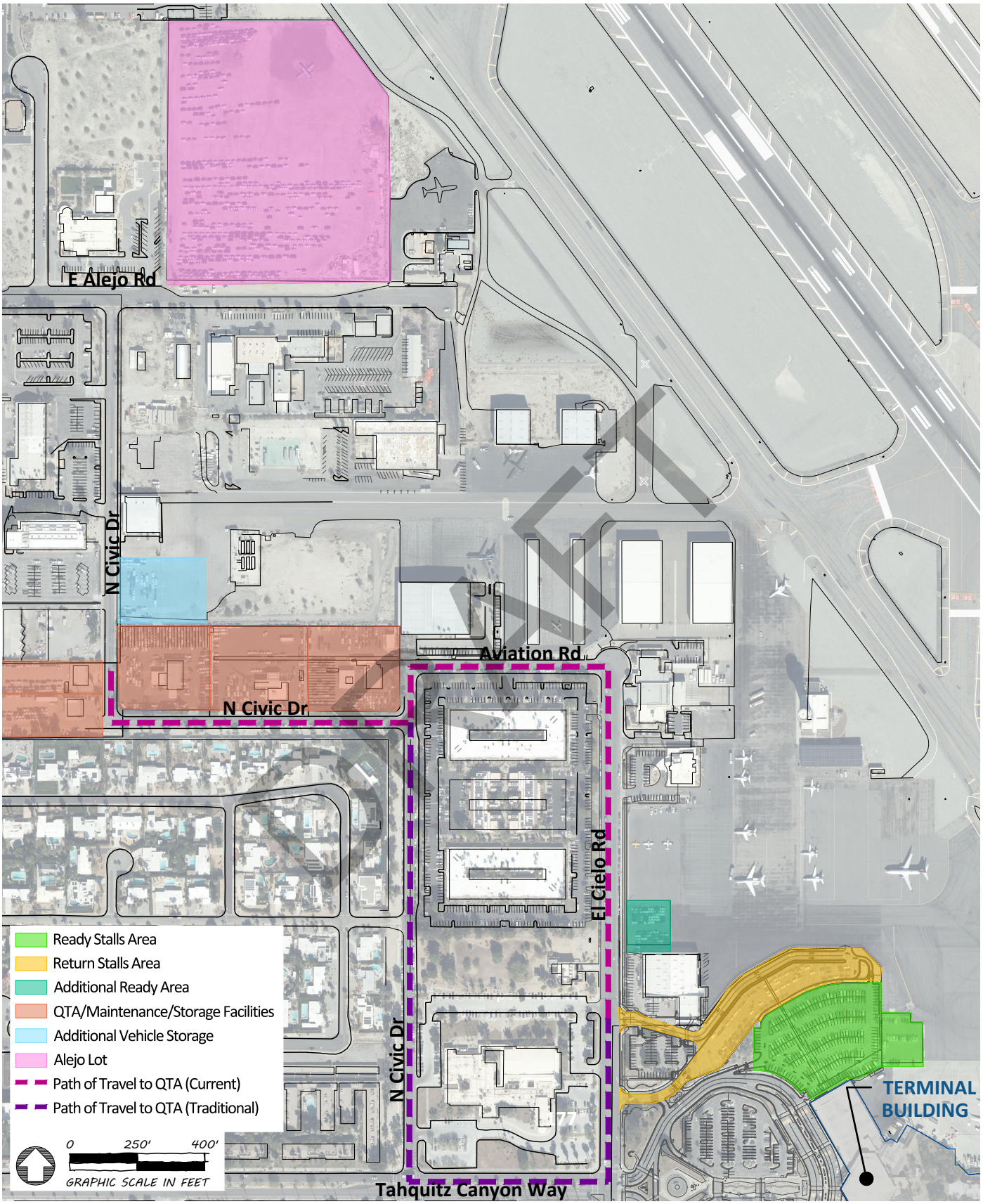
Rental Car Facility Requirements (CONRAC)

Walker conducted a site visit of the rental car facilities at PSP on May 22, 2023. Currently, there are eight on-airport rental car brands that utilize the rental parking areas and facilities. Existing facilities include:

- Ready Parking Area - Adjacent to the northern end of the terminal building and containing 332 spaces.
- Return Parking Area - Lanes wrap around the Ready Parking Area on the north and can be accessed via an entry on El Cielo Rd, contains 150 spaces.
- Additional Ready Parking Area - A supplemental parking area is available to rental car companies next to the USO Building, with approximately 78 stacked spaces.
- Quick Turn Around (QTA) Maintenance and Storage Facilities - There are five distinct areas with QTA amenities (i.e., fueling, washing, vacuuming, light maintenance, etc.) and storage capacity along N Civic Drive.
- Additional Vehicle Storage - There is an extra vehicle storage lot behind one of the QTA areas along N Civic Drive with capacity for about 110 stacked spaces.
- Alejo Lot - There is an additional storage lot located on E Alejo Road that can accommodate hundreds of vehicles. However, in this lot there is a charge of $3 per day per car.
- Economy Lot – During peak seasons, the rental car companies often ask the Airport if they can use the Economy Lot to park their excess vehicles.

Figure 3-18 shows the locations of these rental car facilities, followed by images captured during the site visit.

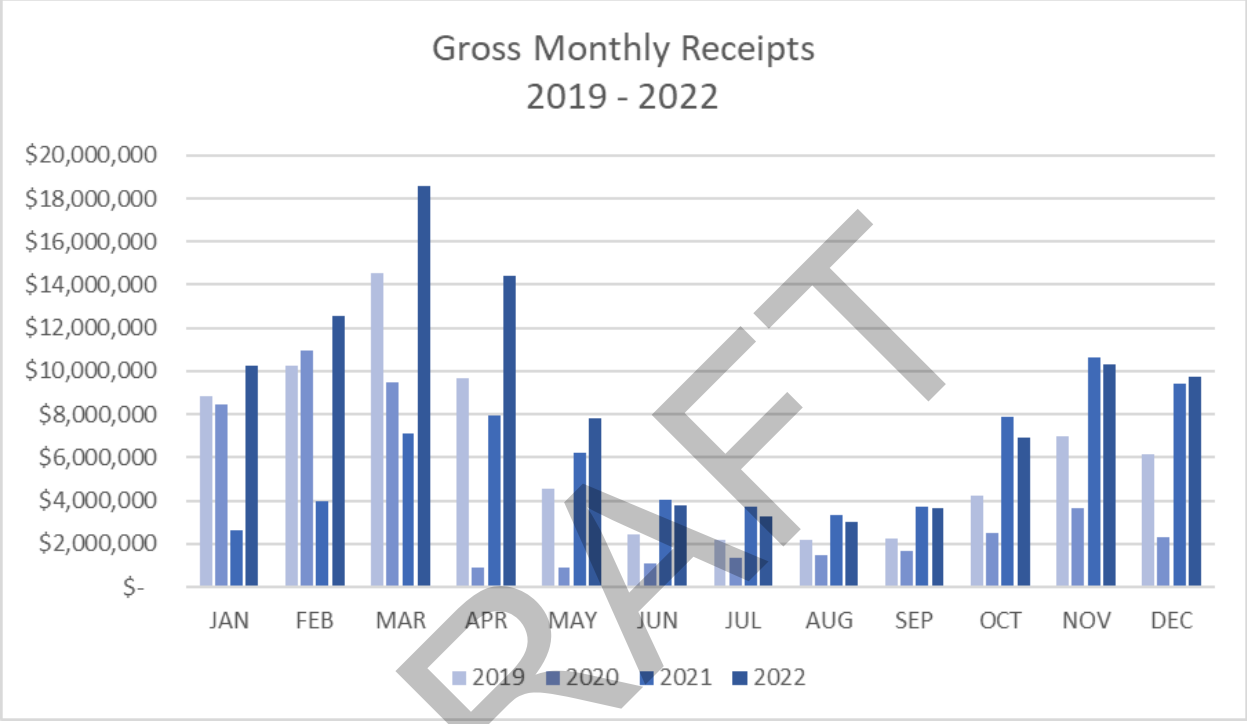
Figure 3-18: Existing Rental Car Lots and Facilities



Rental Car Data Review and Summary

The revenue and transaction data from the Airport and rental car companies spanning the last several years was reviewed. To get a better understanding of rental car operations at PSP, the data was reviewed and summarized.

Figure 3-19: On-Airport Rental Car Gross Monthly Receipts (2019-2022)



Source: *Airport, 2023.*

In terms of revenue, as shown in **Figure 3-19**, 2022 gross monthly receipts have exceeded 2019 (pre-pandemic) levels, indicating that rental car operations have recovered from the impact caused by the pandemic.

Facility Requirements Methodology

Approximately 352 days of hourly transaction data from June 1, 2022, through May 18, 2023, was received from the on-airport rental car companies currently serving PSP. The data were analyzed to determine the 15th busiest hour for pick-ups and 15th busiest hour for returns for each brand individually. The individual busiest hours were added together to represent the planning hour.

This resulted in 203 planning hour rentals and 197 planning hour returns. This represents a roughly eight percent decline in planning hour pick-ups and a 12 percent decline in planning hour returns compared to the 2019 facilities requirements analysis prepared by Ricondo. This is despite 2022 enplanements being 17 percent higher than 2019 enplanements, suggesting that rental car mode share has declined at PSP.

Standard utilization factors were used to determine facility requirements.

PALs were projected using the growth rate in enplanements as a proxy. The facility requirements based on the high growth scenario were projected and it was assumed that rental car needs grow at the same rate as enplanements, which has not been the case recently. The projections provided herein are likely the highest case scenario.

Existing Facilities

The existing rental car facility information is based on data contained in *PSP Rental Car Facility Requirements* (Ricondo, December 2019) as the layout and composition of rental car related facilities has not changed significantly between 2019 and 2023, which is shown in **Table 3-38**.

Table 3-38: Existing Facilities

	Existing Conditions
Customer Service Positions	25 (22 plus 3 supplemental)
Ready/Return Area	
Regular + Premium Ready Spaces	332 spaces
Return Spaces	150 spaces
Total Spaces	482 spaces
Service Areas	
Vehicle Fueling Positions	19 nozzles
Car Wash Bays	5 bays
Vehicle Maintenance Bays	11 bays
Admin Area	3,430 square feet
Overflow Vehicle Storage	1,813 spaces
Stacking/Staging Area	270 spaces
Employee Parking	18 spaces

Source: *Airport, 2023.*

Facility Requirement Analysis

Customer Service Positions

The number of customer service positions recommended for existing conditions is based on a calculation involving planning hour rentals, average transaction time, the percentage of renters who utilize the counter versus those who bypass the counter, and the application of a surge factor to reduce queues during the busiest hours.

The following assumptions are utilized in this analysis:

- Average counter transaction time: five minutes per transaction (12 per hour per position) - reduced from six minutes in the 2019 Ricondo analysis due to continued improvements in technology and processing speeds.
- Planning Hour Rentals: 203 – 15th highest hour for each rental car conglomerate summed together.
- Percentage of customers who utilize the counter for vehicle check out: 75 percent.
- Surge factor: 30 percent.

The calculation of the existing number of customer service positions is shown in **Table 3-39**.

Table 3-39: Customer Service Positions (Existing)

Existing Conditions	
Planning Hour Check-Out Transactions	203
x 75% use counter	152
/12 transaction per counter per hour	13 positions
X 30% surge factor	17 positions needed

Source: *Walker Consultants, 2023.*

The future requirement for customer service positions is based on the high growth scenario for commercial enplanements in PSP's aviation activity forecast. The high scenario includes a 4.5 percent compound annual growth rate from 2022-2032 and a 3.1 percent compound annual growth rate from 2032-2042. **Table 3-40** shows the forecasted number of customer services positions that will be needed in PALs one through four.

Table 3-40: Future Customer Service Positions Need

Existing	2032	2042
17 positions	26 positions	35 positions

Source: *Walker Consultants, 2023.*

Ready / Return Area Sizing

The existing ready areas for rental car check-outs can hold 332 vehicles, and the existing return areas can hold 150 vehicles. The rental car companies have indicated a desire to have 2.0 planning hours of capacity in the ready area, and 1.5 planning hours of capacity in the return area.
Based on the existing planning hour of 203 planning hour rentals and 197 planning hour returns, there is an existing desire for 406 ready rental spaces and 296 return spaces.

Thus, both the ready are and return area are deficient compared to rental agencies desires for existing conditions.

Table 3-41 summarizes future ready/return area needs based on the high growth scenario for commercial enplanements discussed in the previous section.

Table 3-41: Future Customer Service Positions Need

	Existing	2032	2042
Ready Spaces Needed	406 spaces	630 spaces	854 spaces
Return Spaces Needed	296 spaces	459 spaces	623 spaces

Source: *Walker Consultants, 2023.*

Table 3-42 includes the approximate amount of space needed per ready space and return space.

Table 3-42: Ready / Return Space Area Needs

Ready Space Requirements	Return Space Requirements
425 square feet per space, including generous dimensions and drive aisles (103 vehicles per acre). For comparison, an efficient rectangular surface parking lot needs 325-350 square feet per space.	**211 square feet per space (206 vehicles per acre).** Return areas feature stacked parking without drive aisles.
Space Needed 2032: 6.14 acres Space Needed 2042: 8.33 acres	Space Needed 2032: 2.22 acres Space Needed 2042: 3.02 acres

Source: *Walker Consultants, 2023.*

Fueling Positions

Fueling positions in the quick turnaround area are where vehicles are re-fueled, vacuumed, and inspected and where they receive minor touchups as needed. The standard fueling position is similar to fuel pumps at gas stations, with each position having two fuel nozzles, one on either side, servicing two vehicles simultaneously. PSP currently has 19 fueling positions, with the ability to service 38 vehicles.

The following assumptions were utilized to determine existing and future fueling position needs:

- 197 existing planning hour returns – desire is to be able to turn around planning hour returns in one hour.
- 25 percent of vehicles returned full, do not need to access fueling position.
- Each nozzle can service five vehicles per hour (12 minutes per vehicle); each fueling position can service 10 vehicles per hour (5x2).

As in previous sections, this analysis assumes that the growth in rental car needs, and hence fueling position needs is equal to the projected growth (rate) of enplanements at PSP.

Table 3-43: Fueling Positions

	Existing	2032	2042
Fueling Positions	19 (38 nozzles)	23 (46 nozzles)	31 (62 nozzles)

Source: *Walker Consultants, 2023.*

Wash Bays

Wash bays are where vehicles are quickly washed in the QTA, before being returned to the ready area. The current system at PSP has a throughput of 1.5 minutes per vehicle per bay, which is shown in **Table 3-44**.

The following assumptions were utilized to determine existing and future wash bay position needs.

- 197 Existing planning hour returns – desire is to be able to turn around planning hour returns in one hour.
- Each wash bay can accommodate 40 vehicles per hour (1.5 minutes per vehicle).
- Current wash bay system is maintained and repaired as needs dictate.

Table 3-44: Wash Bays

	Existing	2032	2042
Wash Bays	5	8	11

Source: *Walker Consultants, 2023.*

There has been increased prevalence of automated car wash tunnel systems in the external car wash industry. These automated tunnel systems can accommodate 75-150 vehicles per hour depending on the length of the tunnel.

Stacking / Staging Area Analysis

Shown in **Table 3-45** the stacking/staging areas are where vehicles are held prior to and after QTA functions such as washing, fueling and minor maintenance. The industry norm for stacking/staging area, per PSP's rental car vendors is 1.6 times the number of planning hour returns.

Table 3-45: Stacking / Staging Area Analysis

	Existing	2032	2042
Stacking/Staging Area	315	490	662

Source: *Walker Consultants, 2023.*

Other Facility Requirements

Existing requirements for other rental car related facilities, including administrative areas, employee parking needs, light maintenance bays and vehicle storage are assumed to be the same as determined in

the prior 2019 analysis. This analysis has updated the analysis for the 2032 and 2042 analysis years based on the projected growth in enplanements at PSP, which is shown in **Table 3-46**.

The table below summarizes the existing and future facility requirements and area needed to accommodate the requirements. It must be noted that these projections assume no change in future mode share.

Table 3-46: Future Rental Car Facility Requirements

	Existing			PAL 2			PAL 4		
	Quantity	SF	Total SF	Quantity	SF	Total SF	Quantity	SF	Total SF
Customer Service Area									
Counter Positions	25	290	7,250	26	290	7,540	35	290	10,150
Circulation	30%		2,175	30%		2,262	30%		3,045
Ready/Return/Storage									
Ready Spaces	332	425	141,100	630	425	267,750	854	425	362,950
Circulation	25%		35,275	25%		66,938	25%		90,738
Return Spaces	150	211	31,650	459	211	96,849	623	211	131,453
Circulation	25%		7,913	25%		24,212	25%		32,863
Storage Spaces	1,813	189	342,657	1,634	189	308,826	2216	189	418,824
Circulation	25%		85,664	25%		77,207	25%		104,706
Exit Booths	8	500	4,000	10	500	5,000	12	500	6,000
Circulation	25%		1,200	25%		1,500	25%		1,800
QTA/Service Site									
Fueling Positions	19	360	6,840	19	360	6,840	31	360	11,160
Wash Bays	5	1,650	8,250	8	1,650	13,200	11	1,650	18,150
Stacking/Staging Spaces	270	200	54,000	490	200	98,000	662	200	132,400
Maintenance Bays	11	720	7,920	22	720	15,840	26	720	18,720
Admin Area	3,430		3,430	5,900		5,900	6,600		6,600
Employee Parking	18	250	4,500	83	250	20,750	92	250	23,000
Circulation	25%		21,235	25%		40,133	25%		52,508
Small Market Entrant	5%	of area	38,253			53,496			71,253
Total Requirement (Square Feet)			**803,312**			**1,112,243**			**1,496,320**
Total Requirement (Acres)			**18**			**26**			**34**

Source: *Walker Consultants, 2023.*

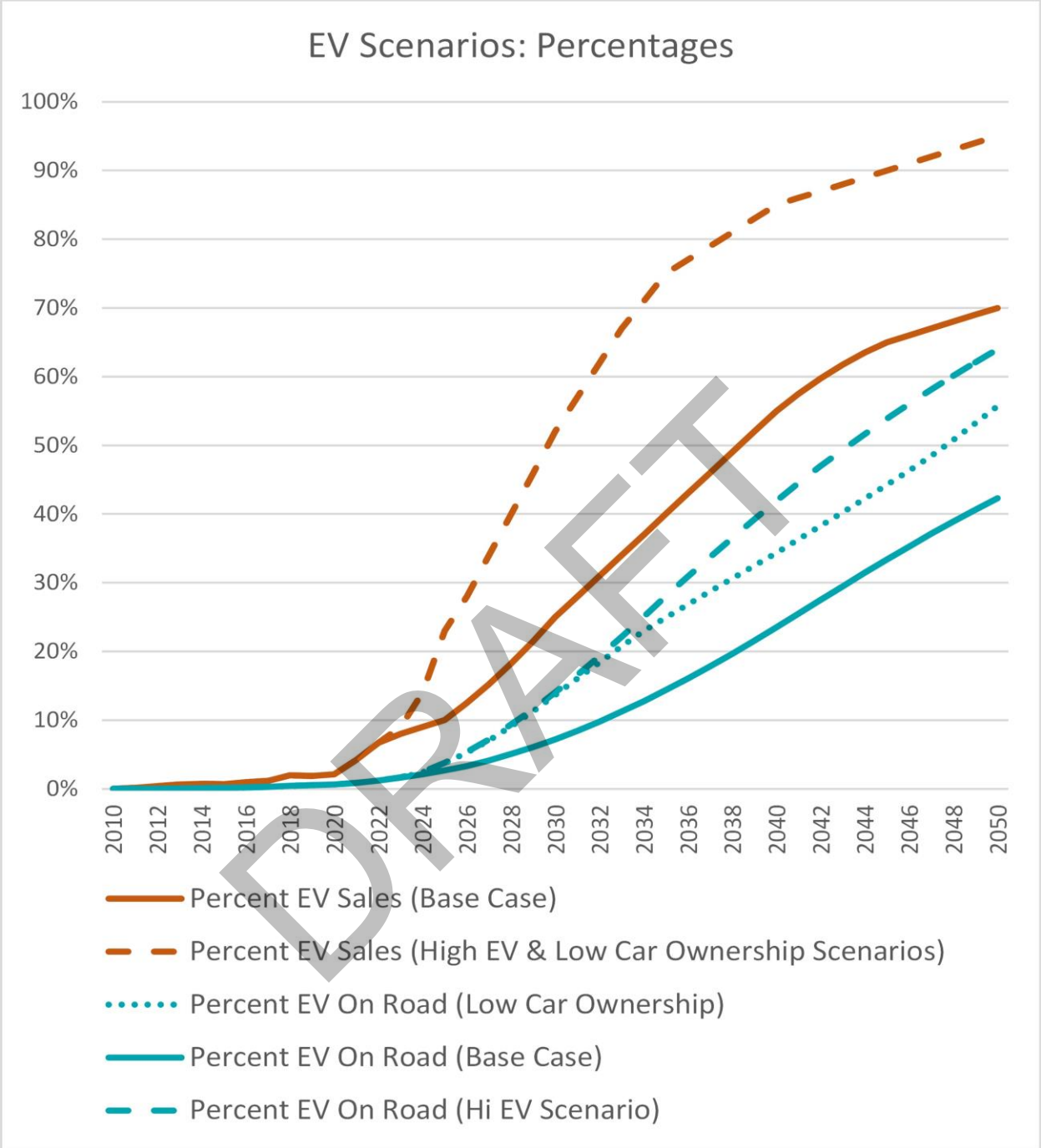
Additional Considerations

EV Chargers

Beginning in 2035, the State of California will require that all new cars sold in the state be zero-emission vehicles (ZEV) which includes battery electric vehicles (BEV), plug-in hybrid vehicles, (PHEV), and fuel cell electric vehicles (FCEV). With increased sales of electric vehicles, California is leading the country with respect to the EV market. Per the state, as of December 2022, 18.8 percent of new California cars sold were ZEVs.[2] Additionally, officials at the National EV Charging Summit and Expo held in Las Vegas in March 2023 stated that California is seven years ahead of the rest of the country in EV adoption and ancillary infrastructure and policies. As the electric vehicle market continues to grow, especially in California, and as we look toward a 2042 planning horizon, for PSP the importance of having infrastructure to support electric vehicles will only increase over time. Walker's national projections for EVs on the road are shown in **Figure 3-20**.

[2] https://www.gov.ca.gov/2023/01/20/california-zev-sales-near-19-of-all-new-car-sales-in-2022/#:~:text=State%20Actions%20to%20Support%20the%20ZEV%20Market&text=The%20success%20of%20the%20state's,nation%20in%20ZEV%20manufacturing%20jobs.

Figure 3-20: Walker 2023 EV Projection Scenarios (National)



Source: *Walker Consultants, 2023.*

As shown in the figure, by 2042, it is projected that EVs could account for anywhere between 25 percent to 45 percent of vehicles on the road nationally. Still, it is important to remain flexible when planning facilities for a 20-year horizon as these technologies are ever-evolving.

EV Public Parking

PSP currently has six charging parking spaces in its public parking facilities. Two are located in the B section of the Main Lot, and the other four are located in the C section of the Main Lot. The chargers and adjoining parking stalls account for less than one percent of all public parking spaces at PSP.

Regarding the expansion of electric vehicle charging spaces for customers, PSP already has plans to add 80 level two charging spaces in fiscal year 2024 to be added to a new economy parking lot. The addition of these new chargers would increase the number of EV capable spaces from six to 46, and account for 2.7 percent of all stalls in the public parking system at PSP. Recent research indicates that currently a parking system could apportion between five to 10 percent of the overall parking supply as EV spaces to accommodate the EVs that are on the road today, of course local conditions will vary. Nonetheless, it is recommended that the Airport continue to monitor demand for electric vehicles at PSP and provide spaces accordingly.

One challenge that the Airport may need to address as more EVs park at the Airport in the future is how to ensure that charging stations are being used efficiently. For example, today the chargers operate on a first-come first-served basis which can lead to inefficiencies in the sharing of chargers. For instance, if all six of the current chargers are occupied when another EV driver pulls into the lot, under the current model that last EV would not be able to charge until one of the other spaces is vacated. At an Airport, it may take several days before an occupant leaves an EV parking space. It is a challenge that all airports face today, but a potential solution could come by way of a valet system where once cars are charged to max capacity, they can be swapped to non-EV stalls.

EV Employee Parking

Currently, no chargers were observed in any of the employee, the Airport administration, or tenant parking lots. However, PSP is planning on installing 10 electric vehicle charging spaces to the employee lot. The addition of the 10 EV spaces would account for 3.5 percent all current employee, administration, and tenant parking spaces. As with the public parking areas, it is recommended that the Airport continue to monitor demand and provide spaces accordingly.

EV Rental Cars

Rental car companies at PSP today, already maintain electric vehicle inventories and have them available for use. However, according to one operator, electric vehicles are currently charged at stations that are located as far as 15 minutes away from the terminal, at least with respect to fast charging which for rental car operations is important for quickly turning vehicles around. With the projected growth of rental car transactions over the 20-year planning horizon as well as the mandate from the state that all new vehicles be ZEVs, electric vehicle infrastructure will be important for any future facilities.

The key consideration in planning for electric vehicle infrastructure for a CONRAC is charging (i.e., fueling). While the quickest way to charge a vehicle is through DC fast charging, these are also the most expensive

chargers and require high-voltage power supply and often necessitate significant electrical infrastructure upgrades, including transformers and distribution panels. On the other hand, level two chargers are much more cost-effective and can be installed without significant modification to the electrical infrastructure.

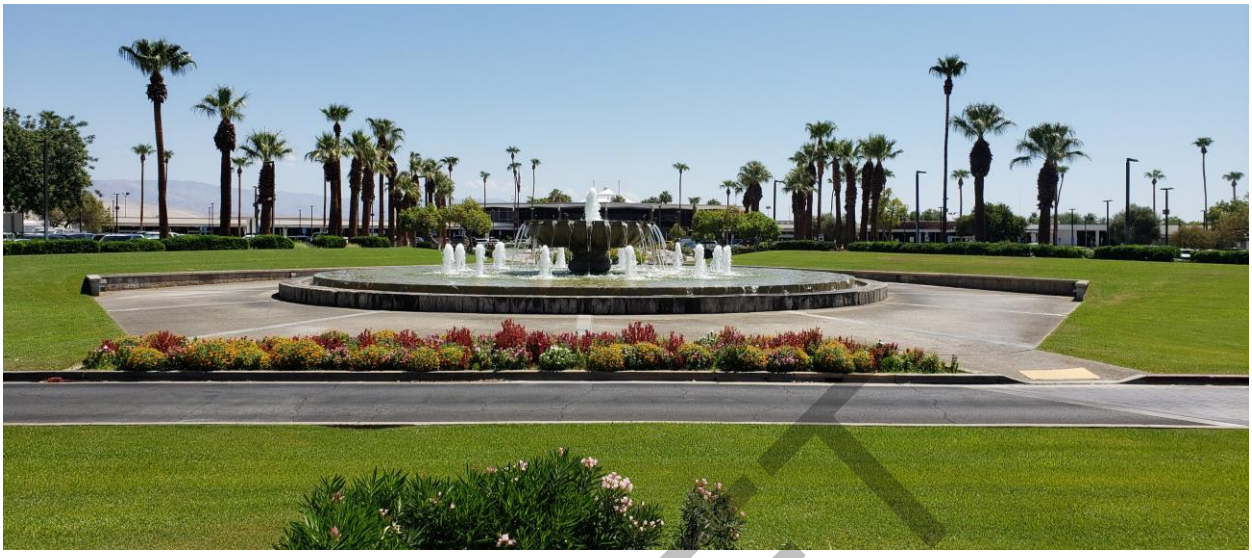
Given the distance between the terminal and current charging locations, for future needs, chargers would likely need to be located closer, especially as rental electric vehicle inventories increase. Proximity to the terminal and consideration for the types of chargers and the amounts needed for maintaining an appropriate level of service will be important.

FACILITY REQUIREMENTS SUMMARY

This chapter quantified operational deficits in the terminal area and terminal building in anticipating of developing initial planning concepts for terminal and concourse renovation and expansion. The initial concepts will not only address space inadequacies and adjacencies but will also address movement paths and passenger circulation throughout the terminal and concourse.

As documented in this chapter, there is a clear need for expansion of the terminal at PSP, as the current total terminal area of approximately 300,000 square feet is much less than the 435,000 square feet that is needed for a functional terminal today. By the time PAL 1 levels of almost two million annual enplanements (4 million annual passengers) are realized, the terminal will not be providing an acceptable level of service to PSP travelers. The following chapters will explore options for meeting the near-term need for additional space in the context of long-term projected growth and passenger demand.

Chapter 4 – Initial Terminal Area Alternatives



INTRODUCTION

The alternative planning process for the Palm Springs Airport (PSP or the Airport) Airport Master Plan was designed to evaluate the information gathered to date including inventory, forecasts, and facility requirements for use in developing initial high-level alternatives. This chapter introduces those high-level alternative concepts developed with the intent to meet future terminal area facility needs detailed in the previous chapter, **Chapter 3 – Terminal Area Facility Requirements**. The high-level development concepts explored in this chapter will be narrowed and refined into more detailed alternatives in the next phase of the process.

The following section outlines the planning assumptions associated with the alternative concepts and the goals that these alternatives are designed to achieve. The Assumptions and Goals section is followed by a description of terminal area opportunities and constraints used as a foundation for initial high-level alternative development. Next, a summary of each alternative concept with its relative advantages and disadvantages are provided. Preliminary screening criteria incorporating City of Palm Springs and Airport sustainability focus categories is then presented to compare terminal alternative concepts.

ASSUMPTIONS AND GOALS

The following assumptions and goals were established to help guide the development and analysis of a range of alternatives designed to accommodate current and future demand at the Airport:

Assumption One: Recommended improvements must comply with local, state, and federal regulations.
The Airport will be developed and operated in a manner that is consistent with local ordinances and codes, federal and state statutes, federal grant assurances, and Federal Aviation Administration (FAA) regulations.

Assumption Two: The terminal area layout must accommodate the critical aircraft for each facility.
The size and type of aircraft that use the Airport, as well as the resulting setback and safety criteria, are the basis for the layout of facilities. Currently, PSP is primarily served by a narrow-body aircraft fleet (ex. Boeing 737 and Airbus A-320 series aircraft), and this is anticipated to continue throughout the planning horizon. As a result, the terminal area is planned to meet design standards for narrow-body aircraft in Aircraft Approach Category D and Airplane Design Group (ADG) III. However, flexibility of the terminal area to accommodate larger, wide-body aircraft is also considered and incorporated into the alternatives. This is considered specifically for areas anticipated to accommodate international flights, including a potential Federal Inspection Station (FIS) facility.

Assumption Three: Limited developable space necessitates efficient and targeted development.
Since the Airport, and the airport terminal area, is constrained, efficient use of developable space is critical.

Assumption Four: For planning purposes, the terminal development envelope for buildings and parked aircraft is located a minimum of 800 feet from the Runway 13R/31L centerline to provide adequate airspace and wingtip clearance.
The 800-foot distance delineates a boundary where objects approximately 43 feet in height can be located without penetrating Federal Aviation Regulations (FAR) Part 77 “Imaginary Surfaces” applicable to runways with a precision approach. While PSP does not currently have a precision approach, previous Master Plan studies have planned for the implementation of this approach type.

Aircraft expected to serve PSP on a regular basis have tail heights approaching 42 feet above ground. The 800-foot line provides a development envelope that avoids tail penetrations of parked aircraft to Part 77 airspace surfaces by existing and future critical aircraft. While future terminal concourse elevations are not yet defined in the planning process, the 800-foot building setback line provides a reasonable building restriction line for concourse expansion. The 800-foot setback line also preserves adequate space for PSP to accommodate an apron taxilane parallel to the full-length taxiway of Runway 13R/31L, similar to what exists east of the Sonny Bono Concourse today.

Assumption Five: Consider seasonality and peaking characteristics.

The Airport experiences varying levels of activity during different seasons of the year. Peaking characteristics are considered for evaluation of development alternatives.

Assumption Six: The original Wexler terminal building will be protected and opportunities to feature this unique and historic component of the terminal complex will be pursued to the extent practical.

The original Wexler terminal building was recently listed in the National Register of Historic Places. Terminal development alternatives will strive to enhance the historic features of this building while cost-effectively meeting facility needs.

Assumption Seven: Property in the vicinity of PSP that could support future development may be considered for concept development purposes.

There is limited developable space at PSP. This planning effort will consider expansion potential for future Airport development, including property acquisition.

Goals for Development

Accompanying these assumptions are several goals, which have been established for the purposes of directing planning efforts and establishing continuity for future airport development. These goals consider several categorical considerations related to the Airport's short-term and long-term needs.

Airport Development Goals:

- Enhance the PSP passenger experience.
  - Use of outdoor space.
  - Levels of passenger service and convenience.
  - "Front Door" Access.
  - Outdoor mountain views.
  - Retain the character of the original terminal building designed by Donald Wexler.
- Provide future facility plans that are flexible, cost-effective, financially feasible, and can be implemented in a phased approach.
- Maximize the use of developable space.
- Be responsive to stakeholder needs.
- Enhance revenue generation opportunities.
- Include plans for an FIS facility and provide gates capable of accommodating international arriving passengers.
- Consider future technological changes.
- Incorporate sustainability vision statement and focus categories.

In June of 2023, PSP selected the following Sustainability Vision Statement:

> *It is PSP's commitment to foster a sustainable and resilient future for our community through socially responsible, environmentally sustainable, and economically valuable means.*

Sustainability focus categories selected by PSP include:

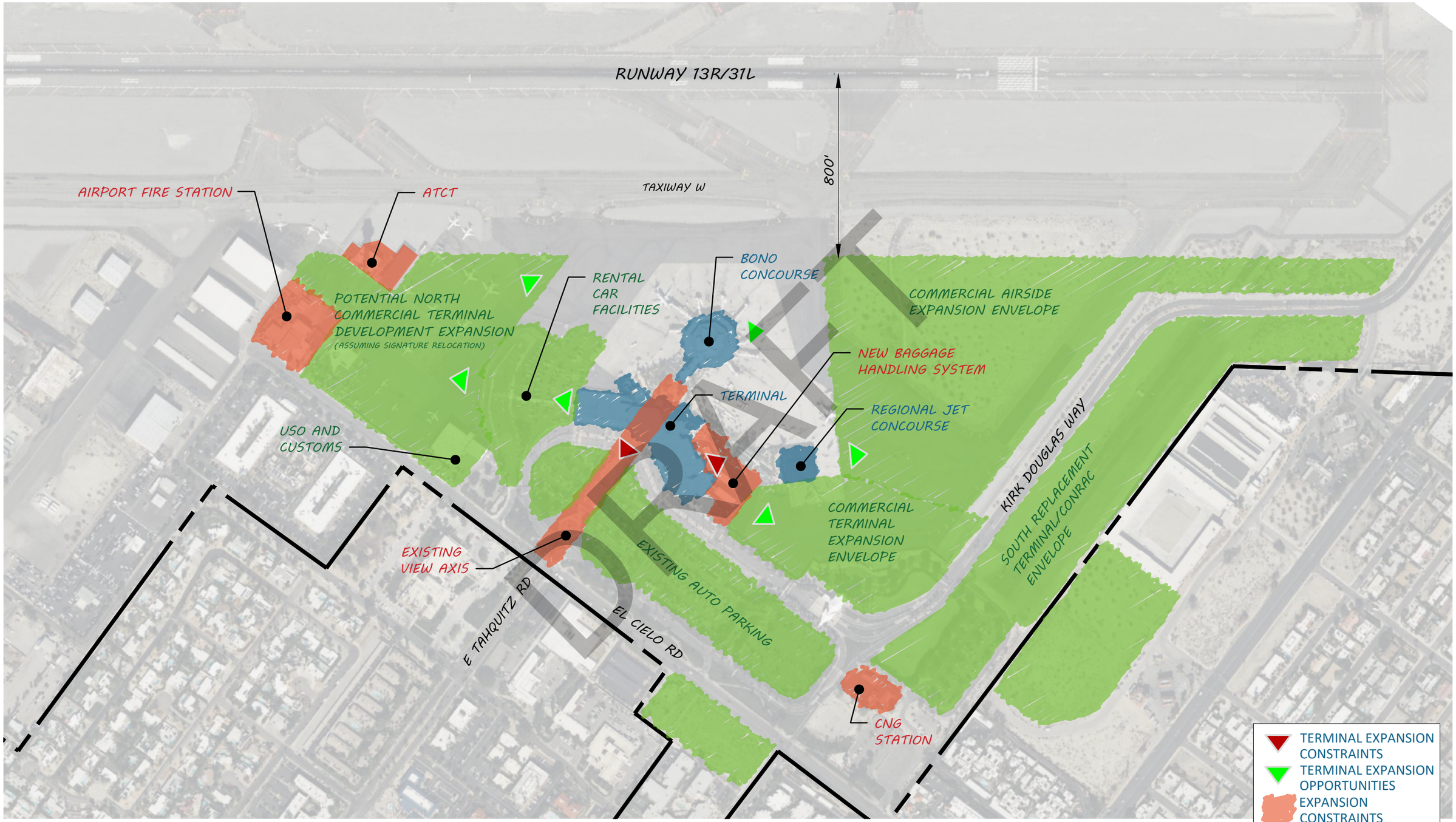
- Airport Finance.
- Land Use and Transportation.
- Resource Management.
  - Energy.
  - Water.
  - Waste.
- Stakeholder Relations.
- Resilience.

OPPORTUNITIES AND CONSTRAINTS

Understanding opportunities and constraints is critical to developing viable alternatives. The opportunities and constraints map, **Figure 4-1**, depicts potential areas that support additional facility expansion or reconfiguration in green. The red areas are constraints that will hinder or potentially prevent future facility development.

Major terminal area constraints include Runway 13R/31L and taxiway infrastructure to the east, the airport traffic control tower (ATCT) and airport fire station to the north, El Cielo Road to the west, and existing roadway and building infrastructure to the south.

Figure 4-1: Opportunities and Constraints



INITIAL TERMINAL AREA ALTERNATIVE CONCEPTS

The PSP terminal, concourse, and Consolidated Rent-A-Car (CONRAC) layout alternatives are the result of an initial effort to establish master plan concepts capable of accommodating 30-32 aircraft gates. This initial work was completed prior to the development of a functional terminal area program based on forecasted future demand. The concepts were used to solicit feedback from the key leadership group at PSP through an in-person visioning session and a follow-up virtual session, resulting in the developed alternates.

The initial high-level Master Plan terminal alternatives were categorized into three approaches:

- **Approach 1: Maximum reuse –** Maintaining operations and access at the current terminal location while maximizing reuse of the existing headhouse and expanding concourse facilities.
- **Approach 2: Partial Reuse –** Maintaining operations and access at the current terminal location, along with reuse of the existing headhouse facilities, while providing all new concourse facilities.
- **Approach 3: Southern Development –** Relocating the terminal operations and concourses to the southern end of the airport property with the headhouse fronting Kirk Douglas Way.

Approach 1: Maximum Reuse

Approach 2: Partial Reuse

Approach 3: Southern Development

For each approach, the CONRAC facility was located to best support passenger needs for ease of accessibility. For Approach 1 and 2, the CONRAC is located to the north, connecting directly to the baggage claim hall. For Approach 3, where the Headhouse is located on Kirk Douglas Way, the CONRAC is located accessing Kirk Douglass Way, either directly to the south or to the southwest.

From the initial approach high-level alternatives, the Master Plan team prioritized the following:

1. Maintain primary access from Tahquitz Way, maintaining the current “Front Door” and connection to downtown Palm Springs.
2. Emphasize the “charm” and ease of use of the current terminal.
3. Maintain the original Donald Wexler design of the terminal building headhouse.
4. Minimize walking distances.
5. Prefer a single level terminal roadway.

6. Access majority of aircraft via a boarding bridge.
7. Maintain current level of service and adjacency of CONRAC to terminal.
8. Maintain an outdoor courtyard space on the secure side of the terminal.

Terminal Area Alternative 1A

Alternative 1A, illustrated in **Figure 4-2**, applies the maximum reuse approach. The headhouse, central courtyard, and Bono concourse are maintained. The alternative includes a new double loaded concourse pier at the south, extending the Part 77 limits for an aircraft to be gated at the east end. The southern gates are served by a dual ADG-III taxilane to accommodate most of the terminal gates, while the remaining northern gates are accessed via a single ADG-III taxilane. The new northern concourse is laid out in a linear arrangement and has direct taxiway access from the gates.

Primary access remains at Tahquitz and El Cielo, with secondary access from the Coachella Valley via Ramon Road. The roadway network would be maintained as a single level roadway system, expanding the curbsides and terminal to the south and north. Along the curbside, the ticketing and baggage claim buildings are expanded to the south and north, respectively. This accommodates growth in the ticketing, security, and the baggage claim programs. Ticketing would shift south, thereby allowing for the Security Screening Check Point (SSCP) to also expand southwards.

Post security, travelers would enter an expanded courtyard providing central access to three concourses: a new south concourse, the existing Bono Concourse, and a new north concourse.

The new southern concourse would accommodate 19 narrow-body gates serving domestic or pre-cleared arriving operations. The concourse would be dual level, accommodating the expanded baggage handling system at the apron level and loading by jet bridge at the second level. A dual level concourse could also accommodate ramp loaded aircraft operations.

The existing Bono Concourse remains and would not require modifications in building geometry for this concept. It was noted in early visioning that the indoor/outdoor boundary between the holdroom and upper-level courtyard at this concourse leads to overcrowding at peak operations and may require renovations to increase customer level of service.

The new north concourse can accommodate up to eight narrow-body gates. Four gates are Multiple Aircraft Ramp System (MARs) gates for the FIS, and they could be swapped out for wide-body aircraft at a 2:1 ratio. Given the north concourse's proximity to baggage claim and the arrivals curb, this concourse would also have a sterile corridor and FIS allowing for arriving international flights operations.

Potential advantages of Alternative 1A:

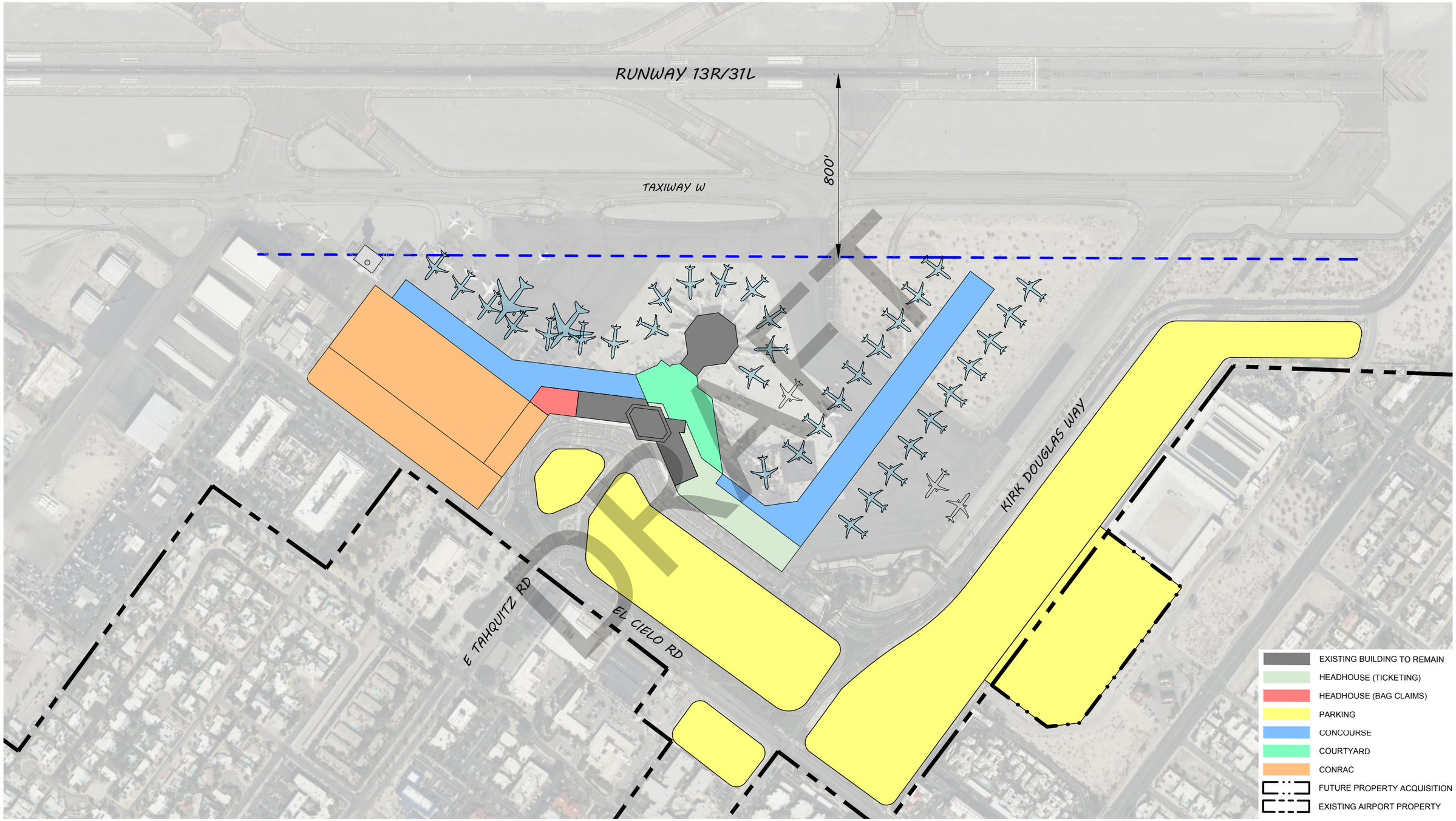
- Reduces cost by maintaining major components.
- Maintains existing character of Palm Springs Airport by preserving major elements.
- Maintains and expands outdoor space post security.

- Locates CONRAC near the baggage claim.
- Locates FIS near the baggage claim.
- Eases construction phasing with multiple and entirely separate concourses.

Potential disadvantages of Alternative 1A:

- Causes disruption from phasing and renovations.
- Introduces a long walking distance from the south concourse to the baggage claim.
- Requires renovation of existing spaces and facilities.

Figure 4-2: Alternative 1A



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Terminal Area Alternative 1B

Alternative 1B, illustrated in **Figure 4-3** maximizes the reuse of existing facilities from Alternative 1A with a new, linear double loaded concourse pier extending from the southeast corner of the Bono concourse. The eastern gates have direct taxiway access, while the gates on the west are served by a dual ADG-III taxilane. At the west there are two concourses that extend north and south of the courtyard.

Primary access to the terminal remains at Tahquitz and El Cielo with secondary access from Ramon. Like Alternative 1A, Alternative 1B maintains the single level roadway system, expanding the curbsides and terminal to the south and north. The ticketing and baggage claim buildings are also expanded to the south and north like Alternative 1A.

Alternative 1B similarly has three concourses: a new south concourse, the existing Bono Concourse, and a new north concourse. The primary function of the new southern concourse remains largely unchanged from Alternative 1A, a dual level concourse accommodating eight narrow-body gates that serve domestic or pre-cleared arriving operations.

The existing Bono concourse and concourse expansion would be accessed from the current location of escalators and elevators. Additional escalators and elevators would need to be added to accommodate the increased foot traffic from the concourse expansion. From the southeast corner of the Bono concourse, a new linear concourse is extended southwest parallel to the runway, adding an additional 14 narrow-body gates. This would require heavy renovation of the Bono concourse in planning and the façade to accommodate the new concourse.

The new north concourse can accommodate up to seven narrow-body gates, of which four are Multiple Aircraft Ramp System (MARs) gates and can be swapped out for wide-body aircraft at a 2:1 ratio for FIS purposes. Given the proximity to baggage claim and the arrivals curb, this concourse would also have a sterile corridor and FIS allowing for arriving international flights operations.

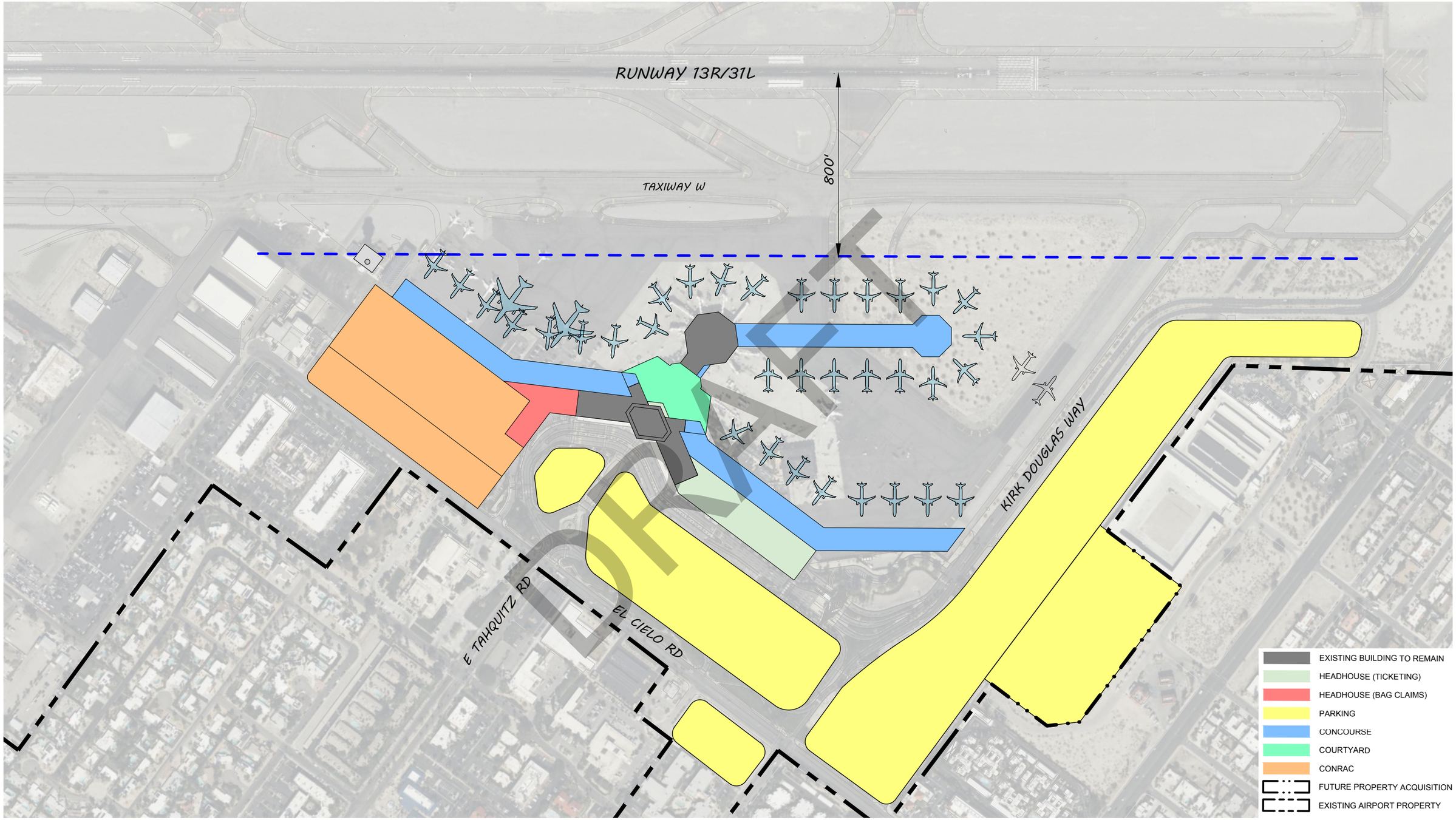
Potential advantages of Alternative 1B:

- Maintains existing character of Palm Springs Airport by preserving major elements.
- Headhouse is centrally located, distributing walking distances among gates.
- Maintains existing outdoor space post security.
- Locates CONRAC near the baggage claim.
- Locates FIS near the baggage claim.
- Allows for ease of construction phasing with multiple and entirely separate concourses.

Potential disadvantages of Alternative 1B:

- Complex renovations of existing facilities that may impact cost and negatively impact passenger experience.
- Does not expand outdoor space post security.

Figure 4-3: Alternative 1B



Terminal Area Alternative 2

Alternative 2, illustrated in **Figure 4-4**, applies the minimum reuse approach; only the headhouse and portions of the central courtyard remain. Overall, the layout is a linear arrangement with most gates served by a new concourse parallel with the runway. This concourse location is along the eastern edge, with parked aircraft tails abutting the Part 77 limit line. Gates on the eastern side have direct taxiway access. The gates on the west can be accessed by a dual ADG-III taxilane that also serves the western concourse pier extension.

Primary access into the terminal remains at Tahquitz and El Cielo with secondary access from Ramon. The single level roadway system is also preserved, expanding the curbsides and terminal to the south and north. Along the curbside, the ticketing and baggage claim buildings are expanded to the south and north, respectively, accommodating the growth in ticketing, security, and baggage claim program. Ticketing would shift south, allowing for the Security Screening Check Point (SSCP) to expand toward the south from its current location.

Post security, travelers would enter an expanded courtyard providing central access to a new eastern and southern concourse.

The new eastern concourse is organized in a linear arrangement parallel to the runways and would gate up to 27 narrow-body aircraft. Four gates could be swapped out for up to two wide-body aircraft at a 2:1 ratio. The concourse is envisioned as dual level, accommodating the expanded baggage handling system at the apron level, and loading by jet bridge at the second level. There is an opportunity for this concourse to also accommodate ramp loaded aircraft operations, which would inform where the final vertical circulation core would be located. At the northern end of the concourse, given the proximity to baggage claim and the arrivals curb, there would be a sterile corridor and FIS allowing for arriving international flight operations.

The southern concourse is designed to accommodate up to five narrow-body aircraft and would need to be dual level for some or all portions to accommodate the baggage handling system and connection. This concourse would service domestic or pre-cleared arriving international operations.

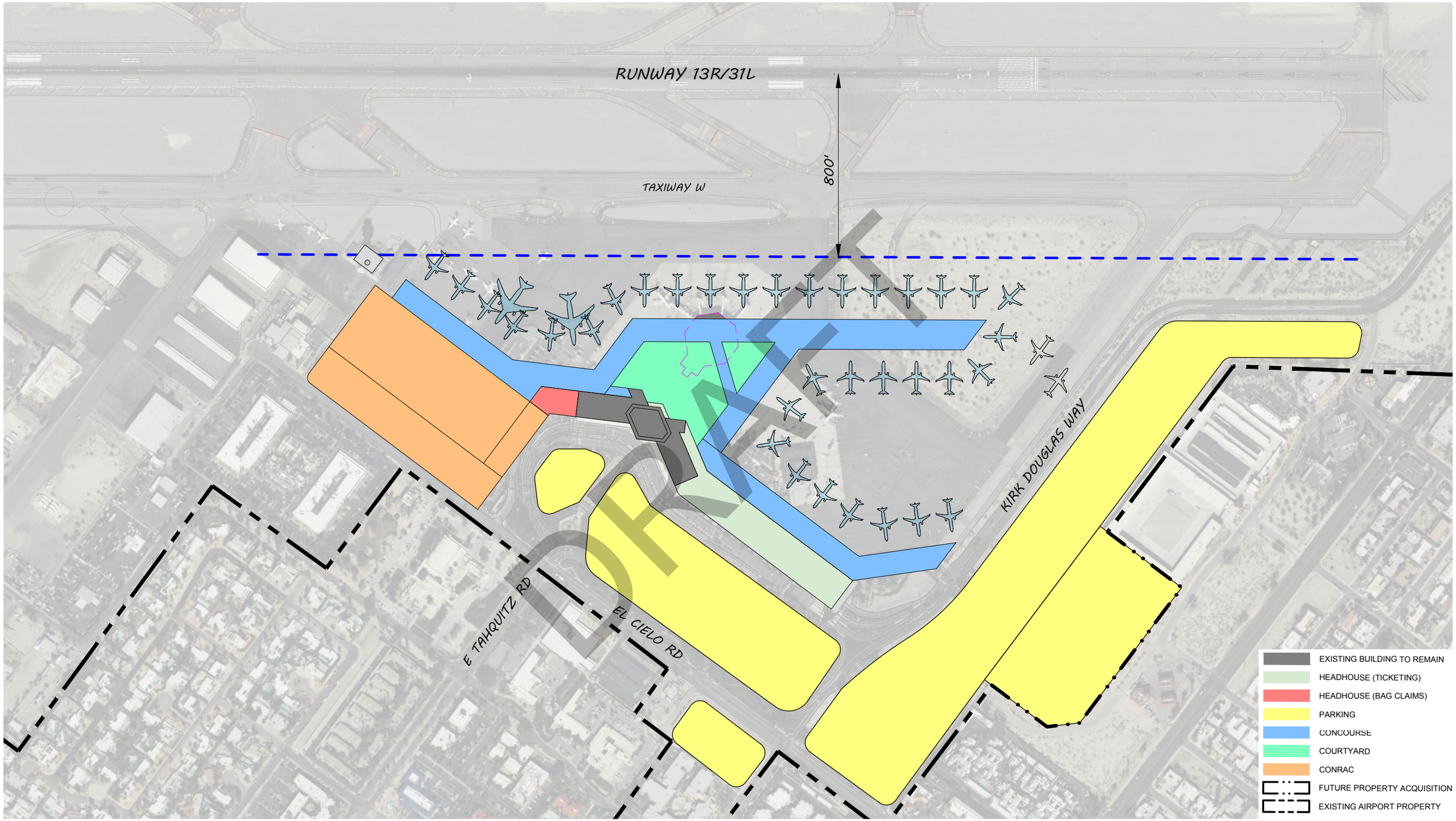
Potential advantages of Alternative 2:

- Maximizes aircraft efficiency with minimal taxi distances to taxiway/runways.
- Expands central courtyard.
- Provides flexibility to accommodate larger number of international arriving gates.
- Centrally locates headhouse, distributing walking distances among gates.
- Maintains and expands outdoor space post security.
- Locates CONRAC near the baggage claim.

Potential disadvantages of Alternative 2:

- Introduces multiple large phases with higher cost impacts that may cause disruptions to passenger experience and operations.
- Complicates construction phasing compared to the two previous alternatives.

Figure 4-4: Alternative 2



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Terminal Area Alternative 3

Alternative 3, illustrated in **Figure 4-5**, relocates all airport terminal and concourse operations to the southern site along Kirk Douglas Drive. Given the historic nature of the Wexler terminal building it would be the only structure to remain, and its function would be determined in the future. The new terminal would span east and west, with three concourse piers extending in a north and south alignment. The western concourse pier extension would be limited in length by the location of the Wexler terminal building, and the central and west concourse piers extend to the limits of the FAR Part 77 limit line. Between the western and central concourse piers is a dual ADG-III taxilane or single ADG-V since, both capable of serving most gates and the two MARs positions. With the layout and site envelope, a single ADG-III taxilane serves the central and east concourse piers.

Primary access to the terminal will remain from Tahquitz and El Cielo; however, both which will require major reworks of the landside roadway system, pedestrian access, and surface parking. On this alternative, the CONRAC is located on the south site, with a few options in placement that will be driven by both landside access and the forecasted area demand.

The new terminal would have the departures curb and ticketing at the east end, and the arrivals curb and baggage claim at the west end. The SSCP is located at the center of the terminal, between ticketing and baggage. There is an opportunity at this point for passengers to ascend to a second level, allowing for space at the apron level for the baggage handling system. This would be developed in the next stage of concept refinement.

Post security passengers can remain in the terminal building or enter a central open-air courtyard. This layout also shows covered portions of the terminal that could be opened to the courtyard while providing coverage from sun or rain, or it could be fully enclosed and conditioned.

All concourse piers are currently envisioned to be two levels, with the flexibility to have some portions be at ramp level to allow for ramp boarding operations. The two-level concourses would allow for passenger enplaning via a boarding bridge on the second level, with a baggage handling system and offices at the apron level. Given the proximity to baggage and arrivals curb, the FIS and sterile corridor would be located adjacent to western concourse pier.

Potential advantages of Alternative 3:

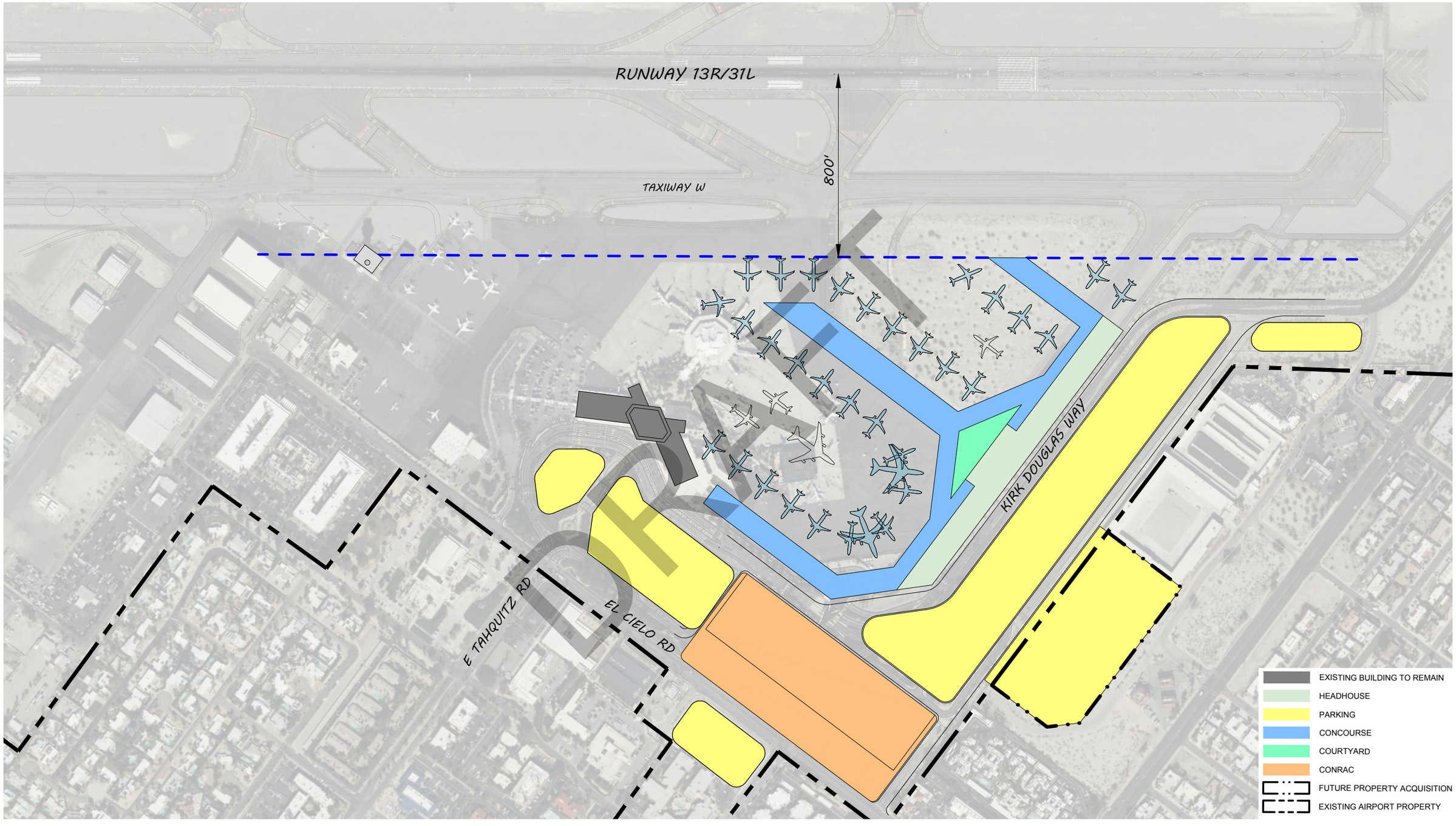
- Creates brand new terminal and parking facilities.
- Minimizes terminal phasing disruptions during construction.
- Provides a larger landside area for the CONRAC.
- Maintains historic Wexler terminal for potential repurposing.

Potential disadvantages of Alternative 3:

- Represents the highest construction cost of the four alternatives, with minimal reuse opportunities.

- Creates major landside phasing disruptions.
- Locates terminal further away from primary roadway access point.
- Disrupts the connection of the terminal to downtown Palm Springs via Tahquitz Canyon Way.

Figure 4-5: Alternative 3



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PRELIMINARY ALTERNATIVE SCREENING CRITERIA AND SUMMARY

To evaluate these alternative concepts individually and against all concepts, a set of preliminary evaluation criteria was established based on six broad screening elements:

- **Passenger Experience.**
- **Stakeholder Relations.**
- **Sustainability and Environmental Factors.**
- **Financial Factors.**
- **Implementation.**
- **Operational Performance.**

A preliminary screening criteria matrix is provided in **Figure 4-6**. The matrix lists criteria for the six categories along with potential strengths and weaknesses of initial alternatives. Screening criteria and scoring of alternatives will be refined based on additional PSP staff input, Working Group input, and further definition of sustainability goals. As alternative concepts are narrowed and refined in the next phase, rough order of magnitude cost estimates will also be developed.

Figure 4-6: Preliminary Terminal Area Concepts Screening Matrix

Initial Terminal Alternative Screening Criteria	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3
Passenger Experience	**+**	**o**	**+**	**o**
Maintains "PSP Experience" (outdoor space, "front door" access etc.)	+	+	+	o
Enhance the "charm" and ease of use of the current terminal	+	o	o	o
Maximizes outdoor space	+	o	+	-
Minimizes walking distances	-	-	+	o
Stakeholder Relations	**o**	**o**	**o**	**o**
Minimizes community, tenant, and user impacts	o	o	-	o
Enhances community, tenant, and user facilities	+	+	+	+
Socially and politically feasible	o	o	o	o
Sustainability and Environmental Factors	**+**	**+**	**+**	**+**
Maximizes reuse of existing facilities	+	+	o	-
Supports PSP resiliency (extreme heat / climate change, earthquakes, etc.)	+	o	+	+
Supports efficient land use / maximizes use of developable space	+	+	+	+
Avoids impacts to and enhances the use of the original Wexler terminal building	+	+	+	+
Accommodates/enhances connections with other modes of transit (bus, rail, etc.)	o	o	o	o
Allows for closure or repurposing of areas during non-peak seasons	+	+	+	+
Supports efficient use and management of resources (energy, waste, and water)	+	o	o	+
Financial Factors	**+**	**+**	**o**	**o**
Promotes long-term financial viability of the Airport	+	+	+	+
Limits order of magnitude costs	+	o	-	-
Enhances revenue potential (concessions, parking, etc.)	+	+	+	+
Minimizes facility footprint and ongoing operations and maintenance costs	+	o	-	o
Implementation	**+**	**o**	**-**	**+**
Ability to phase	+	o	-	o
Flexibility	+	o	o	+
Minimizes impact to stakeholders and operations during construction	o	o	-	+
Operational Performance	**+**	**+**	**+**	**+**
Accommodates terminal airside program requirements (gates, apron etc.)	+	+	+	+
Accommodates terminal landside program requirements	+	+	+	+
Ability to accommodate growth beyond the planning horizon	+	o	+	o
Ability to incorporate future technological changes	+	+	+	+

Strength of the Alternative	**+**
Neither a Strength nor a Weakness of the Alternative	**o**
Weakness of the Alternative	**-**

Chapter 4 Part II – Refined Terminal Area Alternatives

INTRODUCTION

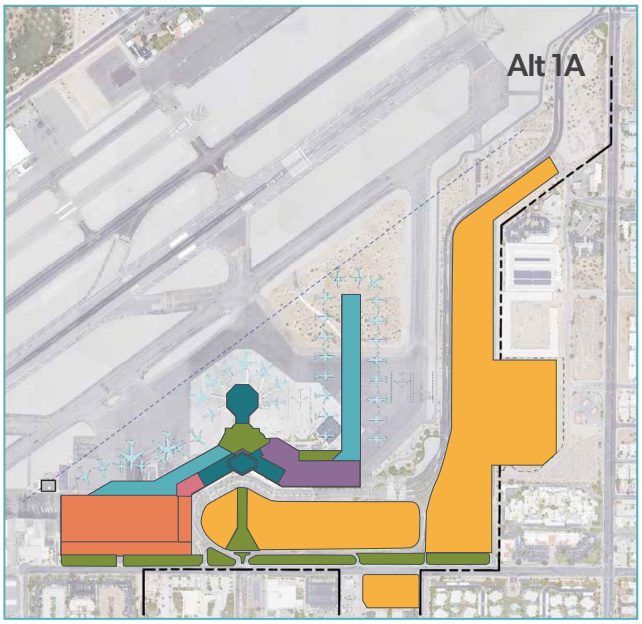
Part 1 of Chapter 4 analyzed four high-level development concepts. These "initial alternatives" were presented to PSP staff, Palm Springs Airport Commission, Master Plan Working Group members, and the Palm Springs City Council. Additionally, a September 2023 open house provided information to the community on the Master Plan process, work completed to-date, an overview of initial alternatives, and a chance for the public to ask questions and provide feedback.

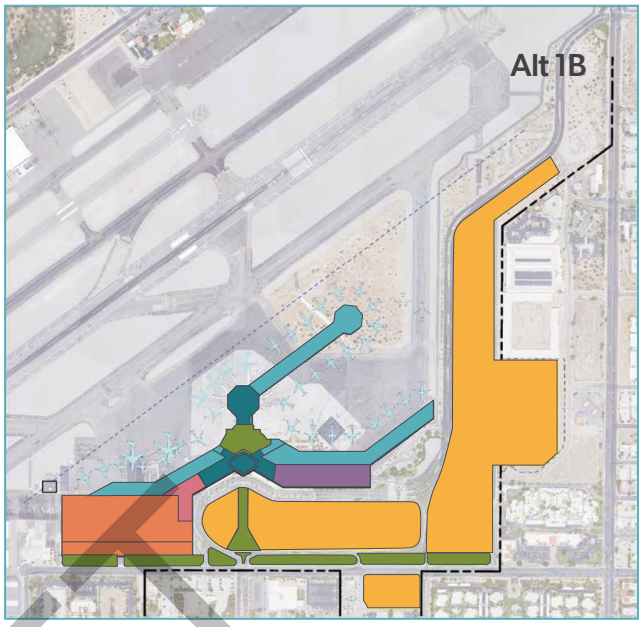
This chapter presents refined versions of Alternatives 1A and 3 with the goal of providing additional analysis to the Working Group, Airport Staff, and the City of Palm Springs that would allow for an informed decision on a preferred alternative. The last section of this chapter provides recommendations for incorporating equity and sustainability in the design of any planned terminal area improvements.

Alternatives 1B and 2 were not carried forward for further refinement. The reasons Alternative 1B was not carried forward include:

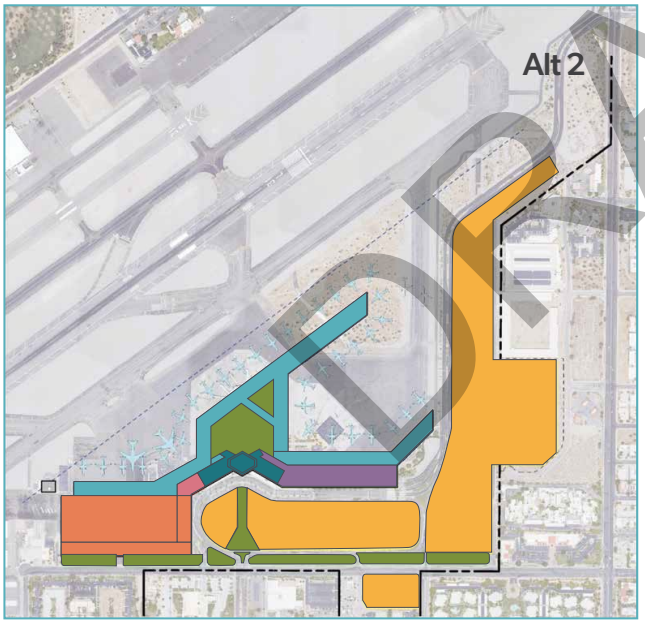
- Alternative 1B's design is less efficient than Alternative 1A. Specifically, 1B requires substantially more concourse space to meet gate needs compared to 1A.
- Alternative 1B requires funneling additional passengers through the narrow circulation space in the Bono Concourse to the new southeast pier.

Figure 4-7: Initial Alternatives





Approach 1: Maximum Reuse



Approach 2: Partial Reuse

Approach 3: Southern Development

N APPROXIMATE SCALE 1" = 1,400'

LEGEND

Property Line	Existing to Remain	Concourse
Future Property	Terminal (Departures)	CONRAC
Surface Parking	Terminal (Arrivals)	Courtyard

- Complex renovations of existing facilities that would increase cost and negatively impact passenger experience.
- Alternative 1B would reduce post-security outdoor space.

The reasons Alternative 2 was not carried forward include:

- Alternative 2 would require complicated construction phasing.
    - Multiple construction phases within the existing terminal footprint would be required.
    - Significant disruptions to passenger experience and operations would be expected during construction.
- Alternative 2 would have high anticipated costs.
    - Higher initial costs are expected due to complicated phasing and construction of a comparatively larger facility footprint.
    - Higher ongoing operations and maintenance costs due to its larger facility footprint.

REFINED TERMINAL AREA ALTERNATIVES

Refinements made to Alternative 1A and Alternative 3 are detailed in the following sections. Construction of the entire 20-year development alternative at one time in not feasible. Consequently, a phasing plan has been developed for each alternative focused on minimizing impacts to terminal passengers and tenants during construction and increasing the funding feasibility of the alternative. Both alternatives include four major phases of construction. Additional objectives of alternative phasing include incrementally meeting the four planning activity levels (PALs) detailed in **Chapter 3 - Terminal Area Facility Requirements** while minimizing costs. Actual construction of alternatives could be broken down into additional phases or consolidated into fewer phases depending on future circumstances and preferences.

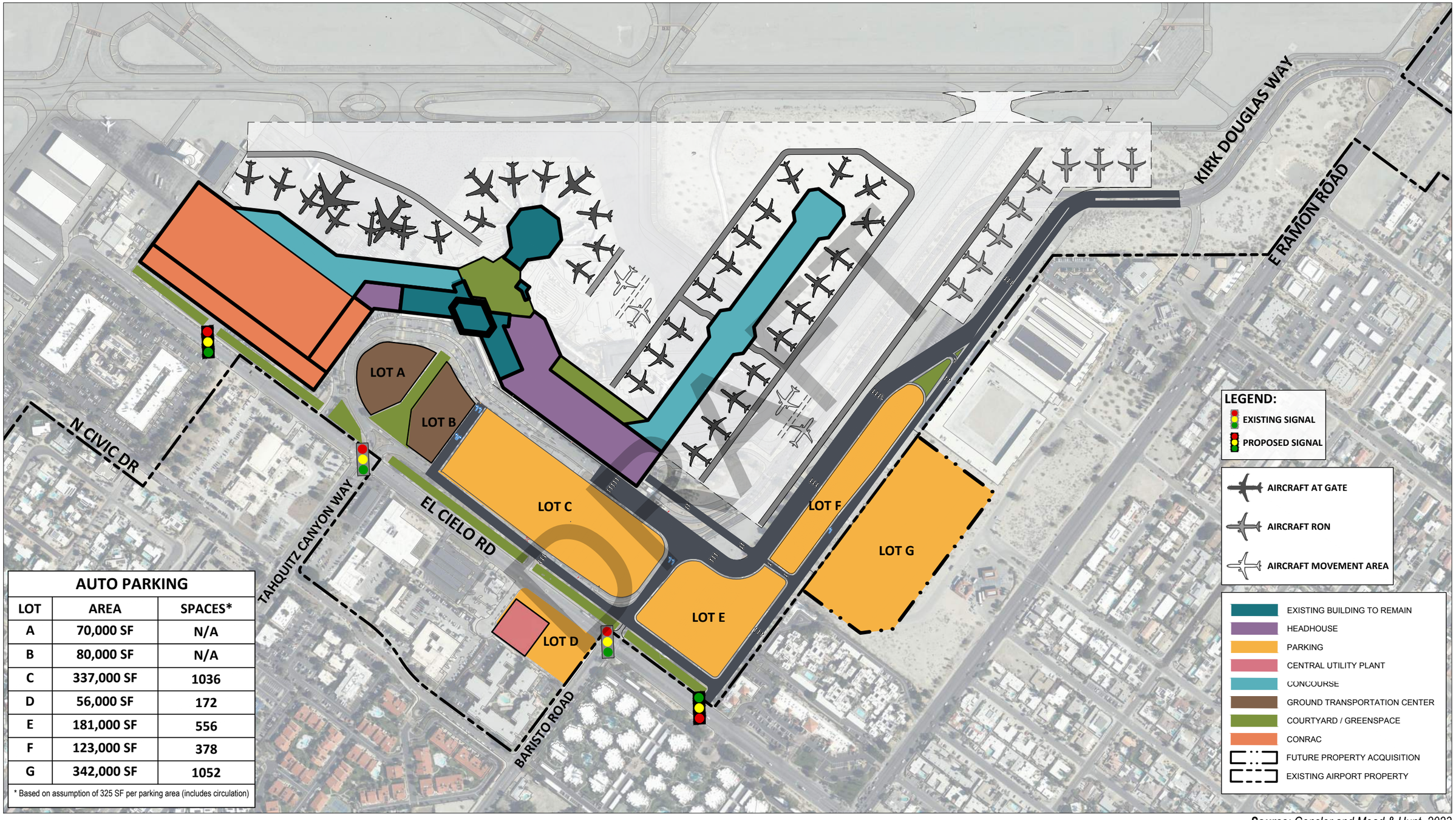
Alternative 1A Overview

Changes to Alternative 1A from the "initial alternative" version include:

- The addition of two rotundas to the southern pier;
- The relocation of Kirk Douglas Way to the south to accommodate dual ADG-III taxilanes between the concourses and additional space for headhouse expansion and post-security outdoor space;
- The addition of a planned Ground Transportation Center (GTC) along with a Central Utility Plant (CUP); and
- The addition of roadway and surface parking details.

The full build out of refined Alternative 1A is shown on **Figure 4-8**. Primary access remains at Tahquitz Canyon Way and El Cielo Rd, with secondary access from the Coachella Valley via Ramon Road and a relocated and reconfigured Kirk Douglas Way. Public access to the Consolidated Rent-A-Car facility (CONRAC) is at the west side of the facility via El Cielo. A traffic signal is proposed at the entrance. An access road for deliveries to the southern end of the proposed terminal is proposed.

Figure 4-8: Alternative 1A Full Build



AUTO PARKING		
LOT	AREA	SPACES*
A	70,000 SF	N/A
B	80,000 SF	N/A
C	337,000 SF	1036
D	56,000 SF	172
E	181,000 SF	556
F	123,000 SF	378
G	342,000 SF	1052

* Based on assumption of 325 SF per parking area (includes circulation)

0 200' 400'
GRAPHIC SCALE IN FEET

***Source**: Gensler and Mead & Hunt, 2023*

The roadway network adjacent to the terminal would be maintained as a single level roadway system, expanding the curbsides and terminal to the south and north.

Along the curbside, the ticketing and baggage claim areas are expanded to the south and north, respectively. This accommodates growth in the ticketing, security, and the baggage claim programs. Ticketing would shift south, thereby allowing for the Security Screening Check Point (SSCP) to also expand. The proposed Ground Transportation Center would accommodate public transportation connections, shuttles, and potentially taxis and ride share vehicles.

Post security, travelers would enter an expanded courtyard providing central access to three concourses: a new north concourse, the existing Bono Concourse, and a new south concourse. Travelers would also have the option of accessing the southern concourse without entering an outdoor courtyard. The existing Bono Concourse remains in this concept.

The new north concourse can accommodate up to eight narrow-body gates. Four gates are Multiple Aircraft Ramp System (MARs) gates for the Federal Inspection Station (FIS), and they could be swapped out for wide-body aircraft at a 2:1 ratio. Given the north concourse's proximity to baggage claim and the arrivals curb, this concourse would also have a sterile corridor and FIS allowing for arriving international flights operations.

The new southern concourse would accommodate 19 narrow-body gates serving domestic or pre-cleared arriving operations. The concourse would be dual level, accommodating the expanded baggage handling system at the apron level and loading by jet bridge at the second level. A dual level concourse could also accommodate ramp loaded aircraft operations.

Options for public and employee parking expansion were considered for every phase of development. Surface parking square footage and the assumed parking spaces provided by proposed lots are detailed in phasing exhibits.

The rough order of magnitude (ROM) cost for the full build out of Alternative 1A is approximately $2.2 billion. The full build out would accommodate 34 narrowbody aircraft gate positions and eight remain overnight (RON) parking positions.

Alternative 1A Phasing

1A - Phase 1

The initial project phase includes the build-out of a new north concourse with 5 gates, which can flex to 7 narrow body gates (**Figure 4-9**). Accommodations for international arrivals with a commercial aviation FIS is included in this phase. The proposed CONRAC connects directly to the terminal, while the Ground Transportation Center (GTC) sits in front of the main entrance. A new Central Utility Plant (CUP) would be constructed on the west side of El Cielo adjacent to a proposed parking lot. Phase 1 in this concept would increase the number of available narrowbody aircraft gate positions from 18 to 25. This number is reduced to 23 if two widebody aircraft are present at the new north concourse. The ROM cost for Phase 1 is approximately $900 million.

1A - Phase 2

The proposed Phase 2 of this concept (**Figure 4-10**) would increase ticketing and security and add a new southern concourse pier with eight gates. The Regional Jet Concourse would be demolished to allow for the pier construction, while Kirk Douglas Way would be realigned to accommodate dual taxiways on both sides of the pier and provide additional space for headhouse and post-security outdoor space. Vehicle flow and surface parking would be reconfigured to account for the realignment of Kirk Douglas Way and maximizing parking potential. There would be 24 narrowbody aircraft gate positions after completion of this phase. The ROM cost for Phase 2 is approximately $1.1 billion.

1A - Phase 3

Phase 3 of this concept (**Figure 4-11**) would extend the south pier to the east and accommodate five additional gates. After completion of Phase 3 there would be 29 narrowbody aircraft gate positions. The ROM cost for Phase 3 is approximately $100 million.

1A - Phase 4

The proposed Phase 4 of this concept (**Figure 4-12**) is the final phase and includes the last expansion to the south pier with five additional gates added to the east end. There would be 34 total narrowbody gate positions after Phase 4 is completed. The ROM cost for Phase 4 is approximately $100 million.

A summary of Alternative 1A phasing is provided in **Table 4-1** along with planning activity level (PAL) requirements for gate positions and vehicle parking.

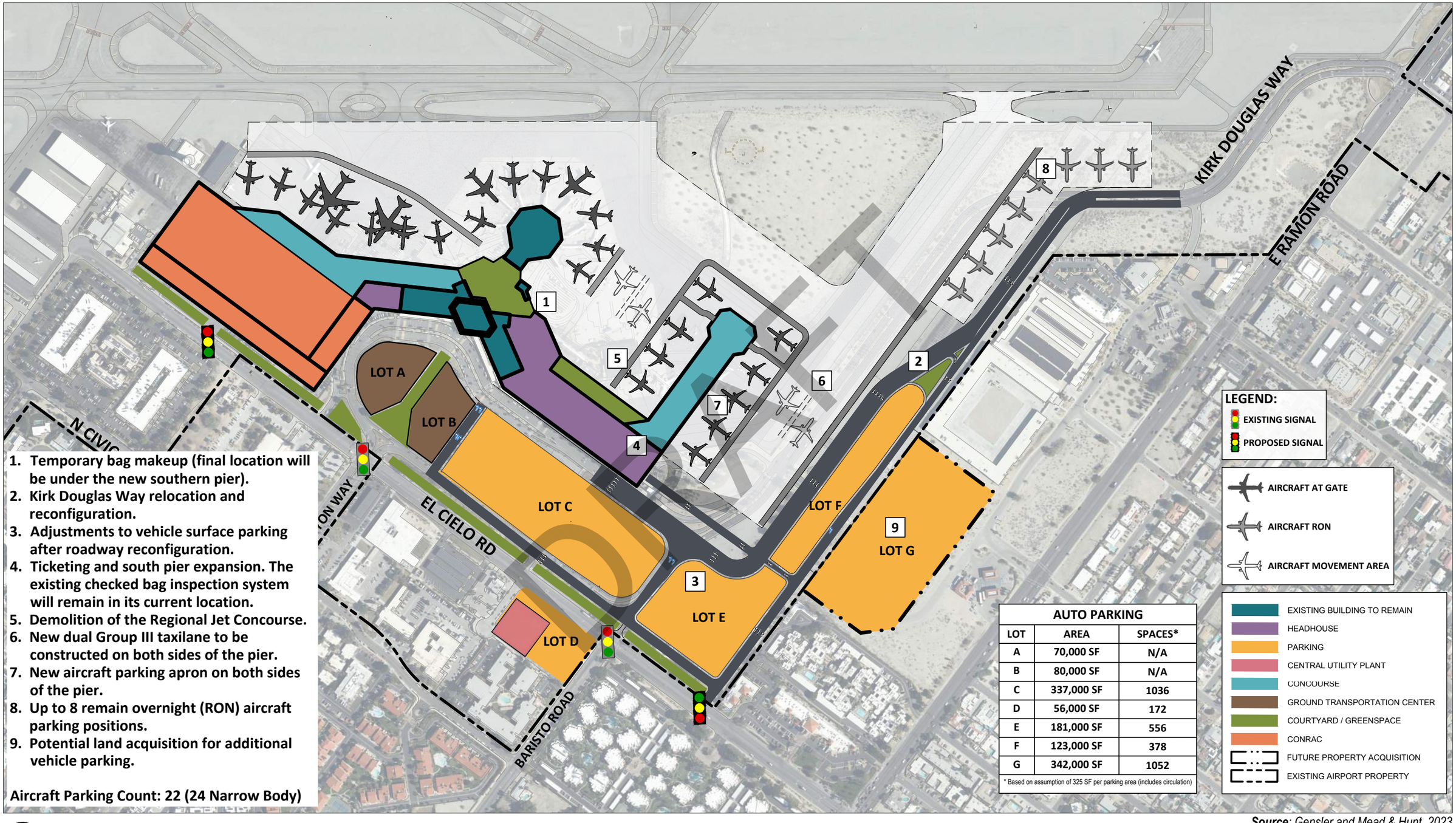
Figure 4-9: Alternative 1A Phase 1

AUTO PARKING		
LOT	AREA	SPACES*
A	70,000 SF	N/A
B	80,000 SF	N/A
C	247,000 SF	760
D	56,000 SF	172
E	116,000 SF	356
F	418,000 SF	1286
G	66,000 SF	204

* Based on assumption of 325 SF per parking area (includes circulation)

***Source**: Gensler and Mead & Hunt, 2023*

Figure 4-10: Alternative 1A Phase 2



AUTO PARKING

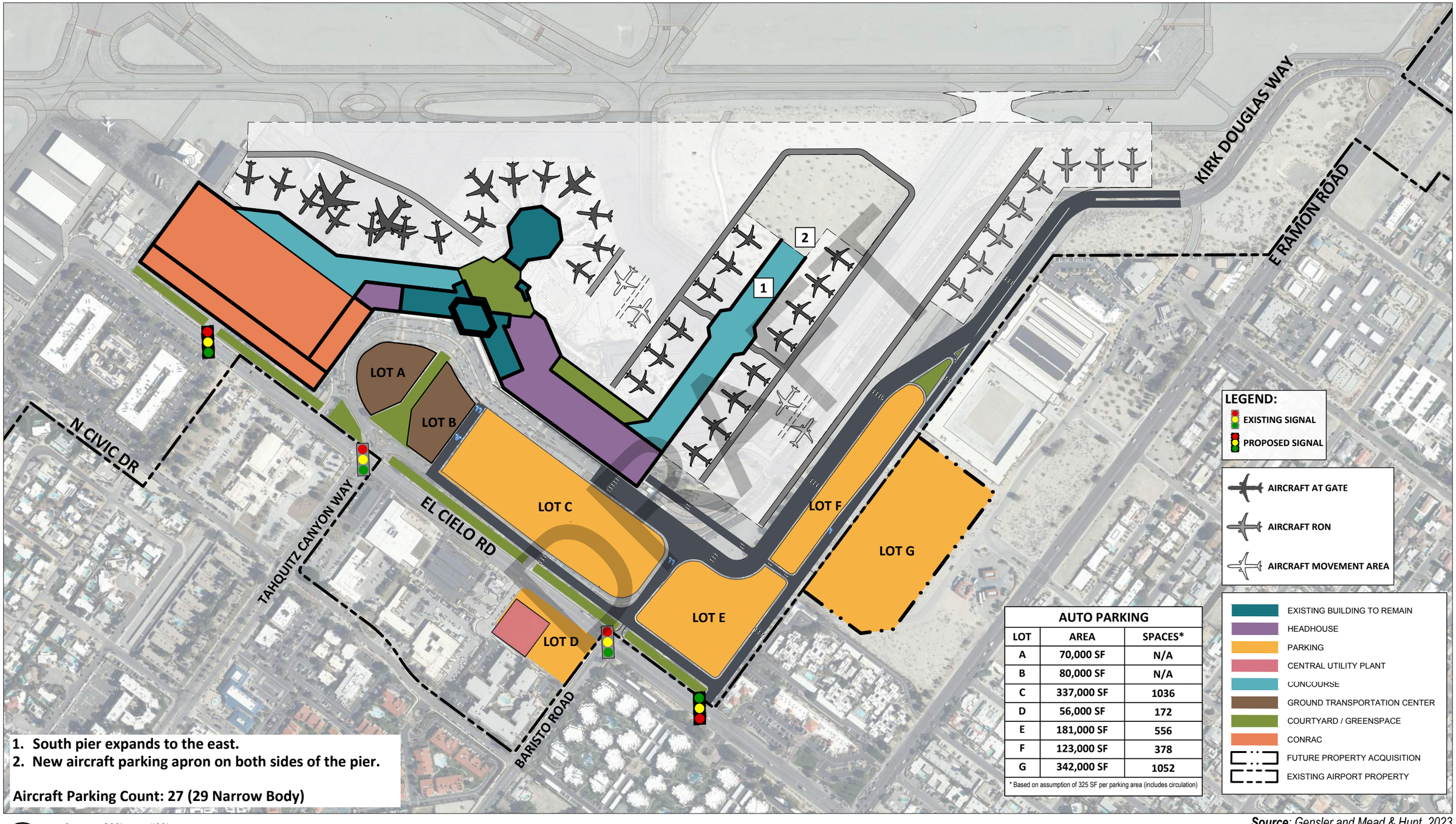
LOT	AREA	SPACES*
A	70,000 SF	N/A
B	80,000 SF	N/A
C	337,000 SF	1036
D	56,000 SF	172
E	181,000 SF	556
F	123,000 SF	378
G	342,000 SF	1052

* Based on assumption of 325 SF per parking area (includes circulation)

0 200' 400'
GRAPHIC SCALE IN FEET

***Source**: Gensler and Mead & Hunt, 2023*

Figure 4-11: Alternative 1A Phase 3



AUTO PARKING		
LOT	AREA	SPACES*
A	70,000 SF	N/A
B	80,000 SF	N/A
C	337,000 SF	1036
D	56,000 SF	172
E	181,000 SF	556
F	123,000 SF	378
G	342,000 SF	1052

* Based on assumption of 325 SF per parking area (includes circulation)

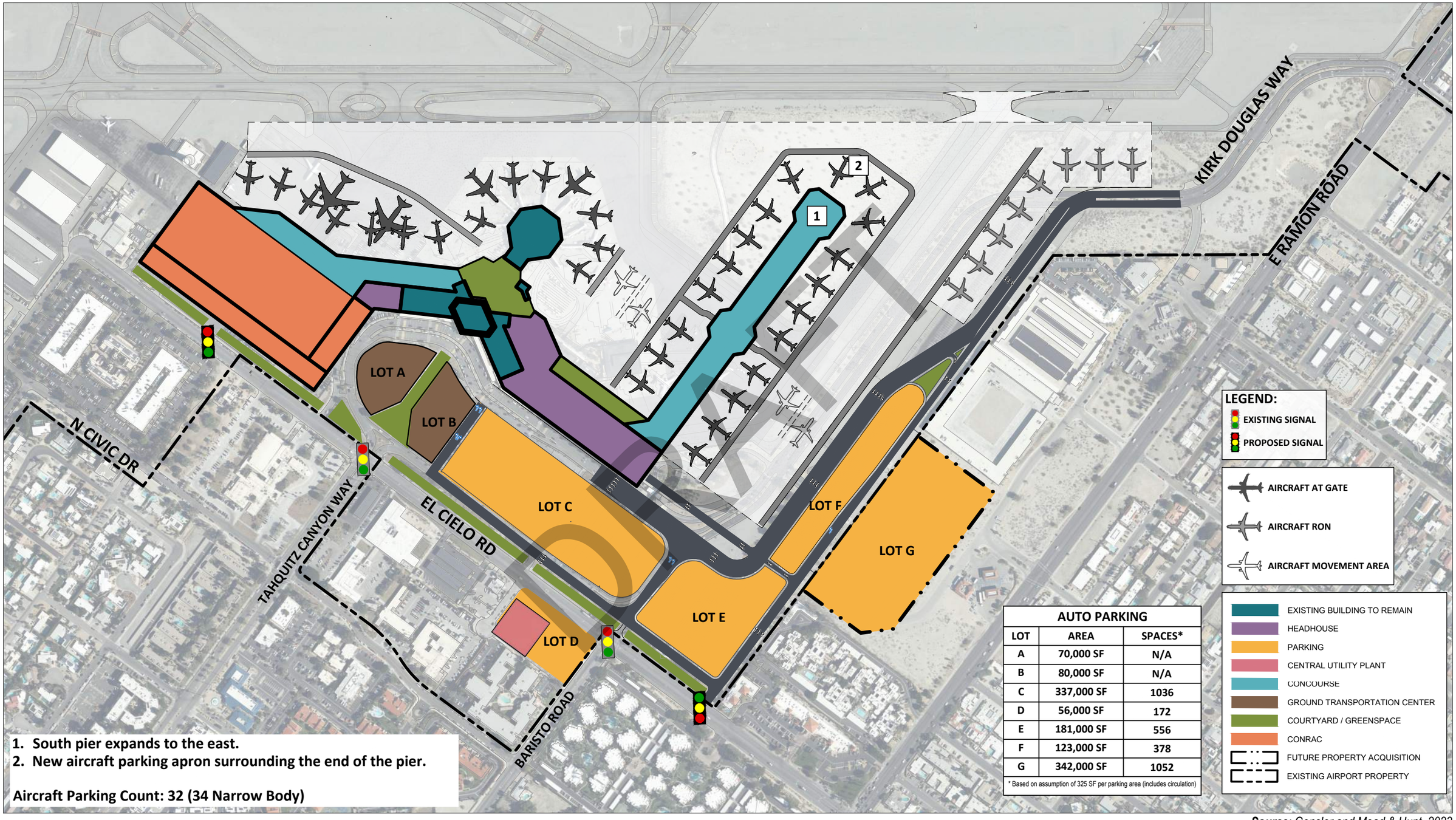
1. South pier expands to the east.
2. New aircraft parking apron on both sides of the pier.

Aircraft Parking Count: 27 (29 Narrow Body)

0 200' 400'
GRAPHIC SCALE IN FEET

***Source**: Gensler and Mead & Hunt, 2023*

Figure 4-12: Alternative 1A Phase 4



AUTO PARKING		
LOT	AREA	SPACES*
A	70,000 SF	N/A
B	80,000 SF	N/A
C	337,000 SF	1036
D	56,000 SF	172
E	181,000 SF	556
F	123,000 SF	378
G	342,000 SF	1052

* Based on assumption of 325 SF per parking area (includes circulation)

1. South pier expands to the east.
2. New aircraft parking apron surrounding the end of the pier.

Aircraft Parking Count: 32 (34 Narrow Body)

0 200' 400'
GRAPHIC SCALE IN FEET

***Source**: Gensler and Mead & Hunt, 2023*

Table 4-1: Alternative 1A Summary

Alternative 1A				
Consideration	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
Phase ROM Cost	$900M	$1.1B	$100M	$100M
ROM Total Cost	*$900M*	*$2B*	*$2.1B*	*$2.2B*
Gate Positions (Narrowbody)	25	24	29	34
RON Positions	5	8	8	8
Courtyard s.f. (secure side)	61,000	88,000	88,000	88,000
Surface Parking Spaces	2,778	3,194	3,194	3,194
Planning Activity Level Requirements	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**
Gate Positions (Narrowbody)	23	24	27	32
Public & Employee Parking Spaces	2,063	2,450	2,756	3,321

Alternative 3 Overview

Changes to Alternative 3 from the "initial alternative" version include:

- The easternmost pier is no longer on a north-south alignment; it now runs parallel to the runway and adjacent to the relocated Kirk Douglas Way.
- The addition of a Ground Transportation Center along with a Central Utility Plant.
- Additional roadway and surface parking details are provided.

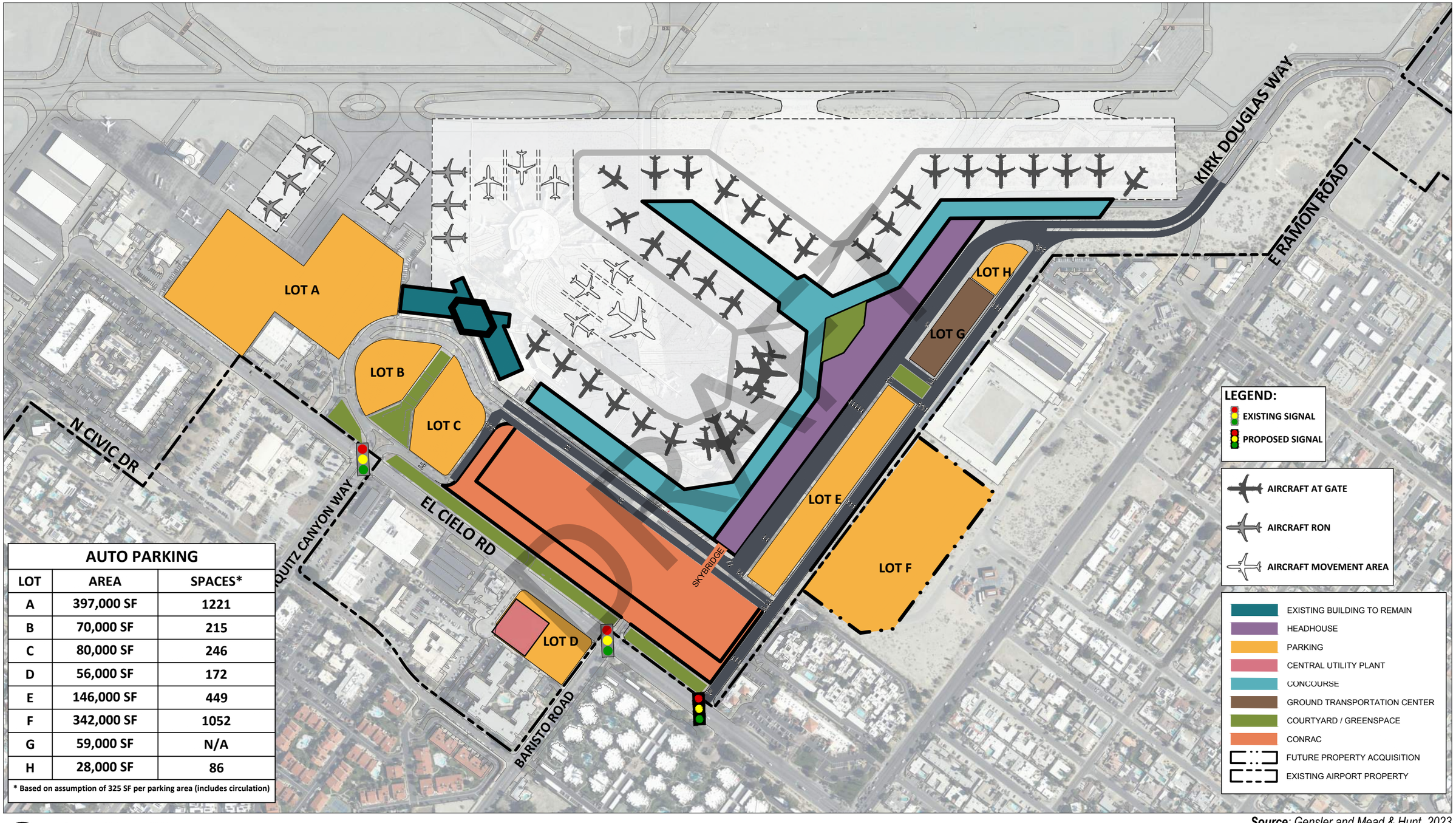
The full build out of refined Alternative 3 is shown on **Figure 4-13**.

Alternative 3 replaces and relocates the airport terminal and all concourses to the southern side of the terminal area along the relocated and reconfigured Kirk Douglas Way. Given the historic nature of the Wexler terminal building it would be the only structure to remain, and its new function would be decided by the community. The new terminal would span east and west, with two concourse piers extending in a north and south alignment and the third pier running parallel to the runway along Kirk Douglas Way. Between the western and central concourse piers is a dual ADG-III taxilane or single ADG-V taxilane, and the two MARs positions.

Access to the terminal from Tahquitz and El Cielo would remain; however, major reworks of the landside roadway system, pedestrian access, and surface parking is anticipated. Secondary access from El Cielo would be available via a proposed road along the southern edge of airport property. Access from the Coachella Valley is provided via Ramon Road and the reconfigured Kirk Douglas Way. Public access to the CONRAC is at the west side of the facility via El Cielo. A traffic signal is proposed at the entrance.

The new terminal would have the departures curb and ticketing at the east end, and the arrivals curb and baggage claim at the west end. The proposed Ground Transportation Center would accommodate public transportation connections, shuttles, and potentially taxis and ride share vehicles. The SSCP is located at

Figure 4-13: Alternative 3 Full Build



AUTO PARKING		
LOT	AREA	SPACES*
A	397,000 SF	1221
B	70,000 SF	215
C	80,000 SF	246
D	56,000 SF	172
E	146,000 SF	449
F	342,000 SF	1052
G	59,000 SF	N/A
H	28,000 SF	86

* Based on assumption of 325 SF per parking area (includes circulation)

0 200' 400'
GRAPHIC SCALE IN FEET

***Source**: Gensler and Mead & Hunt, 2023*

the center of the terminal, between ticketing and baggage. There is an opportunity at this point for passengers to ascend to a second level, allowing for space at the apron level for the baggage handling system.

Post security passengers can remain in the terminal building or enter a newly planned central open-air courtyard. Covered portions of the terminal could be opened to the courtyard while providing coverage from sun or rain, or it could be fully enclosed and conditioned.

All concourse piers are currently envisioned to be two levels, with the flexibility to have some portions be at ramp level to allow for ramp boarding operations. The two-level concourses would allow for passenger enplaning via a boarding bridge on the second level, with a baggage handling system and offices at the apron level. Given the proximity to baggage and arrivals curb, the FIS and sterile corridor would be located adjacent to western concourse pier.

Options for public and employee parking expansion were considered for every phase of development. Surface parking square footage and the assumed parking spaces provided by proposed lots are detailed in phasing exhibits. If Signature Flight Support is relocated to the other side of the airfield, available property could be converted to surface parking. For planning purposes, Alternative 3 phasing will show conversion of a large portion of this property to parking. Passengers utilizing this lot and other remote lots would likely require shuttle transportation to and from the terminal GTC.

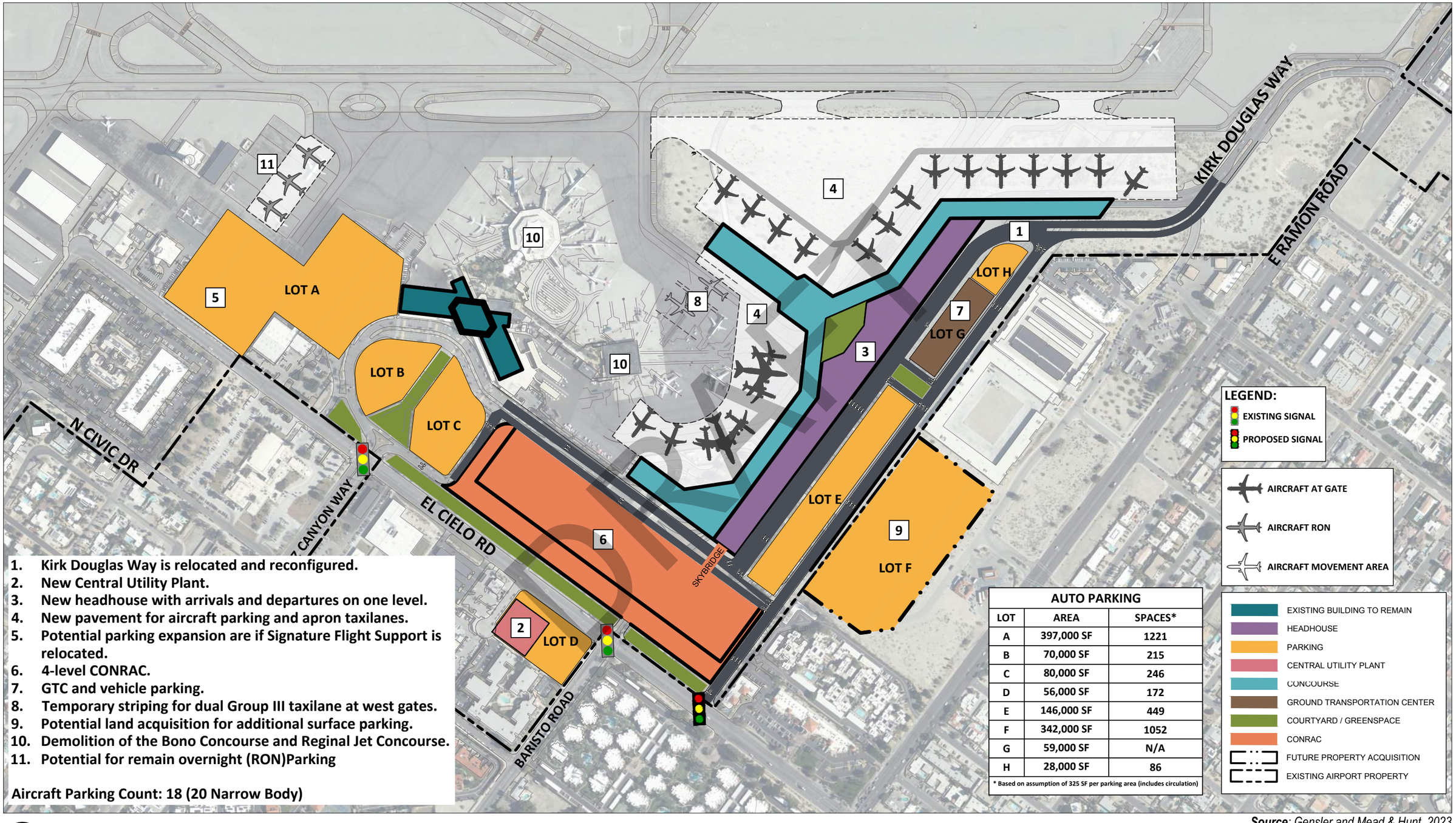
The rough order of magnitude (ROM) cost for the full build out of Alternative 3 is approximately $2.8 billion. The full build out would accommodate 32 narrowbody aircraft gate positions and eight RON parking positions.

Alternative 3 Phasing

3 - Phase 1

Phase 1 of this concept includes an all-new terminal building/headhouse on the south side of the terminal area (**Figure 4-14**). Phase 1 focuses on the processors, ticketing, security, baggage claim, baggage screening, Customs and Border Protection for international arrivals. Phase 1 increases the number of available narrowbody aircraft gate positions from the 18 available today to 20. The number of gate positions is reduced to 18 if two widebody aircraft are present. A new CUP would be constructed on the west side of El Cielo adjacent to a potential employee parking lot. The new CONRAC would be located to the west of the new terminal adjacent to bag claim. Kirk Douglas Way would be relocated to the south, and a GTC is planned directly across from the main entrance. The ROM cost for Phase 1 is approximately $2.2 billion.

Figure 4-14: Alternative 3 Phase 1



***Source**: Gensler and Mead & Hunt, 2023*

3 - Phase 2

Phase 2 of this concept (**Figure 4-15**) would include the addition of four new gates to the central pier that would be built during Phase 1 of Alternative 3. The addition of the four gates would occur after the existing Bono Concourse and Regional Jet Concourse are demolished, and the adjacent apron has been expanded and rehabilitated. The terminal designed by Donald Wexler would be restored during this phase for future use. After completion of Phase 2 there would be 24 total narrowbody aircraft gate positions. The ROM cost for Phase 2 is approximately $400 million.

3 - Phase 3

During Phase 3 of this concept (**Figure 4-16**) the central pier would be extended to accommodate four additional gates for a total of 28 narrowbody aircraft gate positions. The ROM cost for Phase 3 is approximately $100 million.

3 - Phase 4

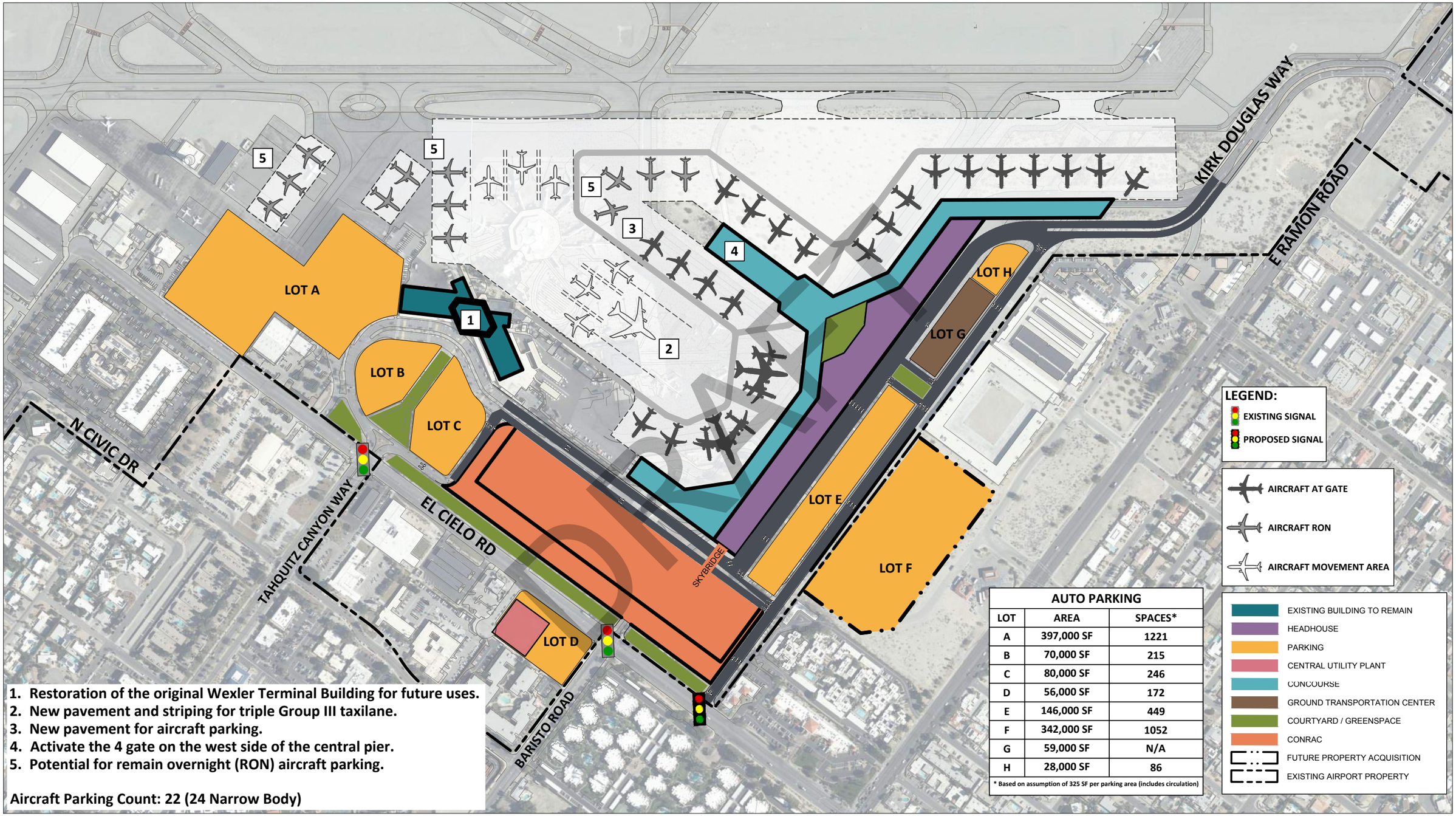
Phase 4 is the final phase proposed phase of this concept (**Figure 4-17**) and includes the expansion of the west pier to accommodate four additional gates for a total of 32 narrowbody aircraft gate positions. The ROM cost for Phase 4 is approximately $100 million.

A summary of Alternative 3 phasing is provided in **Table 4-2** along with planning activity level (PAL) requirements for gate positions and vehicle parking.

Table 4-2: Alternative 3 Summary

Alternative 3				
Consideration	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
Phase ROM Cost	$2.2B	$400M	$100M	$100M
Running ROM Cost Total	*$2.2B*	*$2.6B*	*$2.7B*	*$2.8B*
Gate Positions (Narrowbody)	20	24	28	32
RON Positions	3	11	8	8
Outdoor Courtyard (SF)	26,000	26,000	26,000	26,000
Surface Parking Spaces	3,441	3,441	3,441	3,441
Planning Activity Level Requirements	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**
Gate Positions (Narrowbody)	23	24	27	32
Public & Employee Parking Spaces	2,063	2,450	2,756	3,321

Figure 4-15: Alternative 3 Phase 2



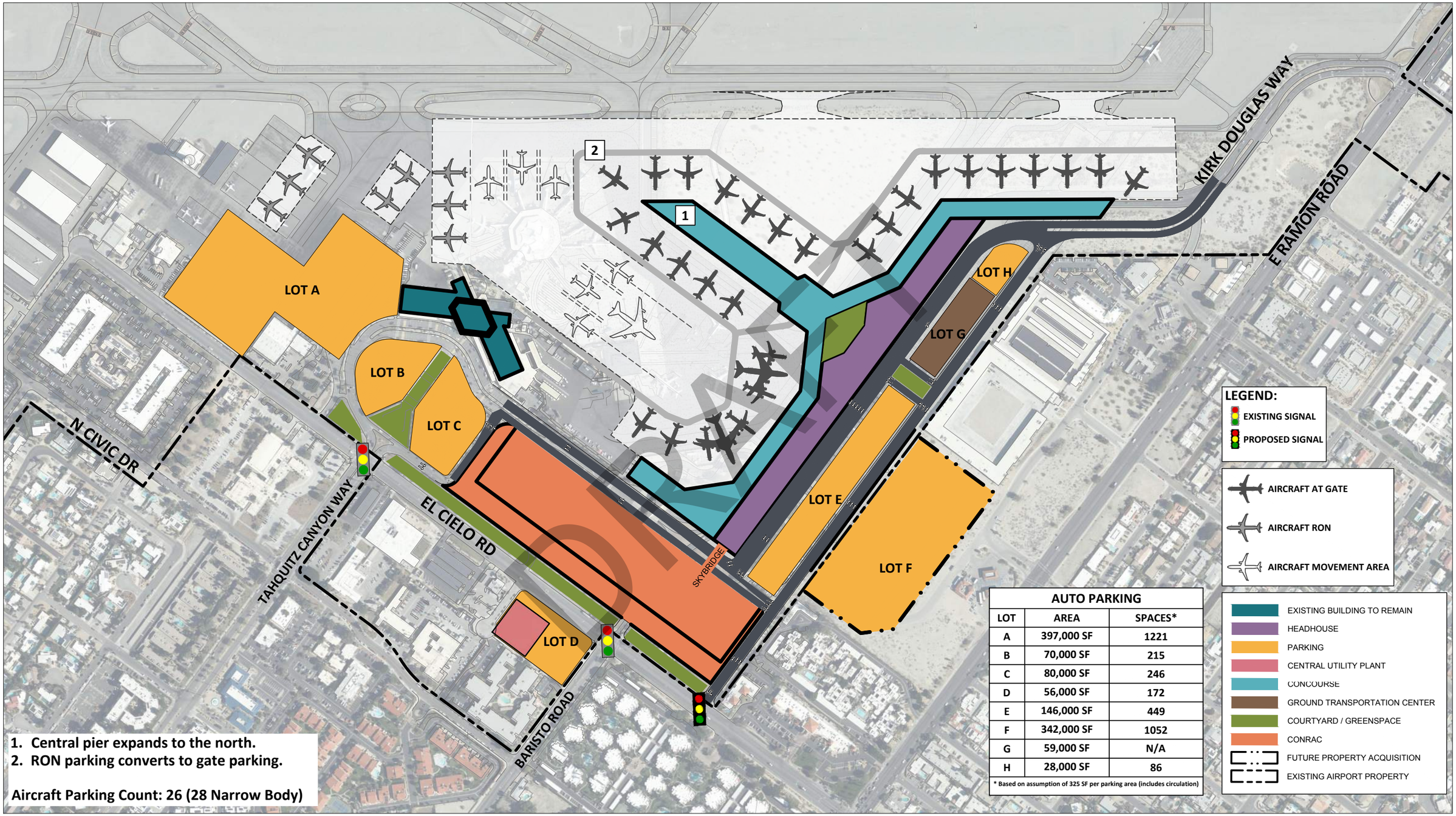
AUTO PARKING

LOT	AREA	SPACES*
A	397,000 SF	1221
B	70,000 SF	215
C	80,000 SF	246
D	56,000 SF	172
E	146,000 SF	449
F	342,000 SF	1052
G	59,000 SF	N/A
H	28,000 SF	86

* Based on assumption of 325 SF per parking area (includes circulation)

***Source**: Gensler and Mead & Hunt, 2023*

Figure 4-16: Alternative 3 Phase 3



AUTO PARKING		
LOT	AREA	SPACES*
A	397,000 SF	1221
B	70,000 SF	215
C	80,000 SF	246
D	56,000 SF	172
E	146,000 SF	449
F	342,000 SF	1052
G	59,000 SF	N/A
H	28,000 SF	86

* Based on assumption of 325 SF per parking area (includes circulation)

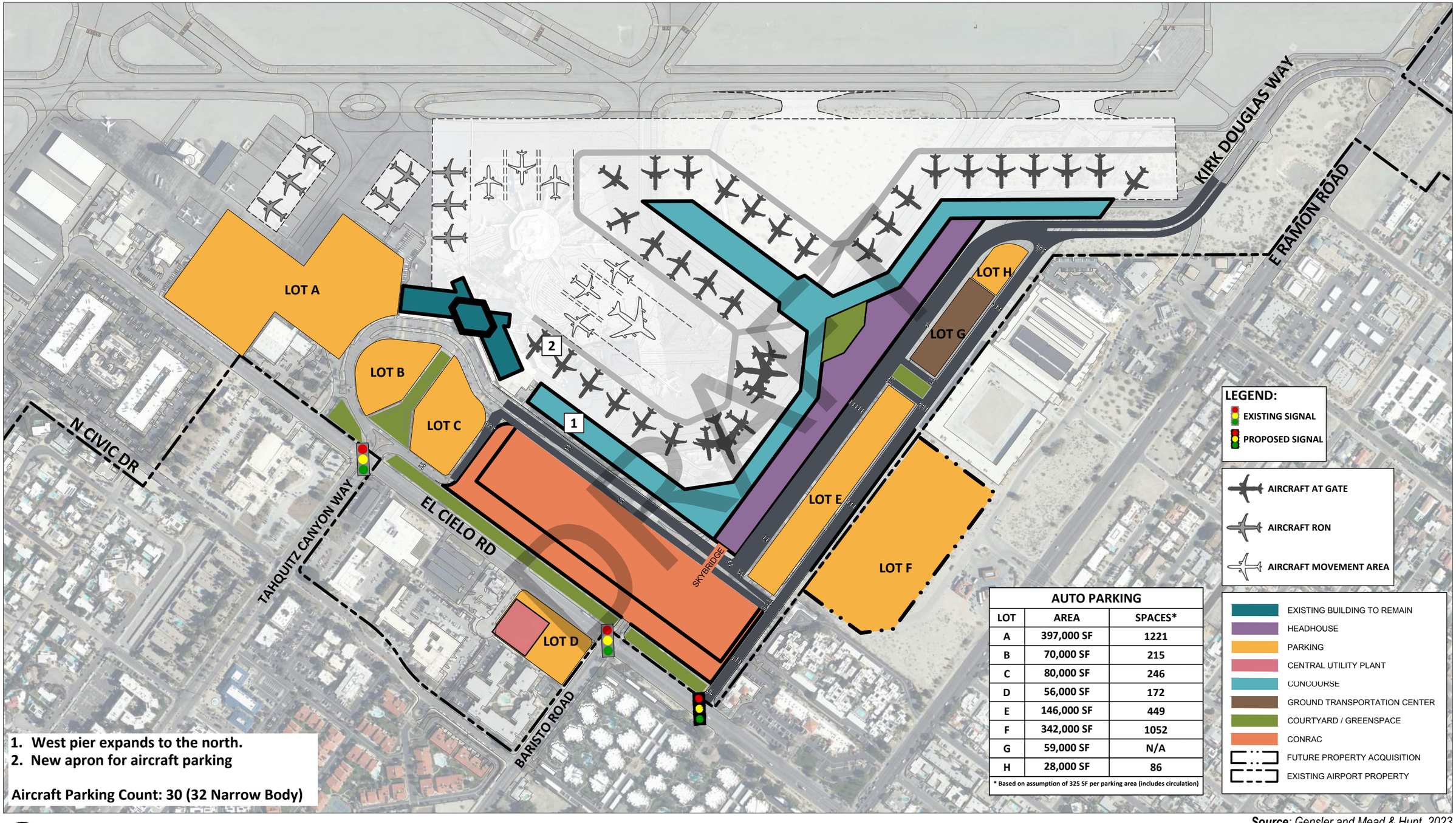
1. Central pier expands to the north.
2. RON parking converts to gate parking.

Aircraft Parking Count: 26 (28 Narrow Body)

0 200' 400'
GRAPHIC SCALE IN FEET

***Source**: Gensler and Mead & Hunt, 2023*

Figure 4-17: Alternative 3 Phase 4



AUTO PARKING		
LOT	AREA	SPACES*
A	397,000 SF	1221
B	70,000 SF	215
C	80,000 SF	246
D	56,000 SF	172
E	146,000 SF	449
F	342,000 SF	1052
G	59,000 SF	N/A
H	28,000 SF	86

* Based on assumption of 325 SF per parking area (includes circulation)

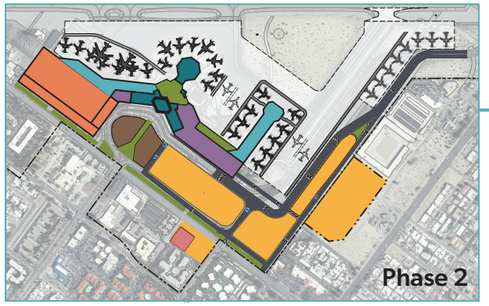
***Source**: Gensler and Mead & Hunt, 2023*

Refined Alternatives Summary

The two alternative development concepts that are the subject of this chapter were indicated as the preferred concepts by the PSP Master Plan Working Group. A public open house was also held to present the initial concepts to the community and a preference was indicated for Alternatives 1A and 1B in this meeting and in online comment submissions from the community. This chapter presented refined versions of the Working Group's preferred alternatives with the goal of providing additional analysis to the Working Group, Airport Staff and the City of Palm Springs that would allow for an informed decision on selection of a preferred alternative. The focus of the additional analysis was on phasing of each alternative and planning level cost estimates for each phase in the alternatives. **Figure 4-18** provides a comparative summary of both alternatives. **Figures 4-19 through 4-23** provide terminal area renderings for Alternative 1A and Alternative 3.

Recommendations for incorporating equity and sustainability in the design of the planned terminal area improvements are provided in the final section of this chapter. After a tentative preferred terminal area alternative is selected, the preferred alternative will ultimately be presented and recommended to the Palm Springs City Council in early 2024 along with a preferred airfield alternative. The combined terminal area and airfield alternatives will comprise the conceptual development plan for this Comprehensive Airport Master Plan.

Figure 4-18: Alternatives Summary

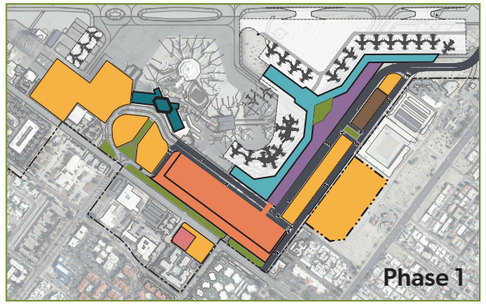


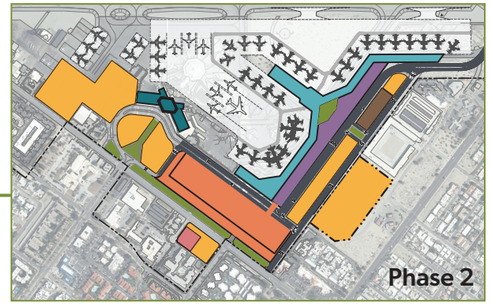
Alternative 1A

Alternative 1A				
Consideration	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
Phase ROM Cost	$900M	$1.1B	$100M	$100M
Running ROM Cost Total	*$900M*	*$2B*	*$2.1B*	*$2.2B*
Gate Positions (Narrowbody)	25	24	29	34
RON Positions	5	8	8	8
Courtyard s.f. (secure side)	61,000	88,000	88,000	88,000
Surface Parking Spaces	2,778	3,194	3,194	3,194

Planning Activity Level Requirements	PAL 1	PAL 2	PAL 3	PAL 4
Gate Positions (Narrowbody)	23	24	27	32
Public & Employee Parking Spaces	2,063	2,450	2,756	3,321

Alternative 3





Alternative 3				
Consideration	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
Phase ROM Cost	$2.2B	$400M	$100M	$100M
Running ROM Cost Total	*$2.2B*	*$2.6B*	*$2.7B*	*$2.8B*
Gate Positions (Narrowbody)	20	24	28	32
RON Positions	3	11	8	8
Courtyard s.f. (secure side)	26,000	26,000	26,000	26,000
Surface Parking Spaces	3,441	3,441	3,441	3,441

Figure 4-19: Alternative 1A Northeast View

***Source**: Gensler, 2023*

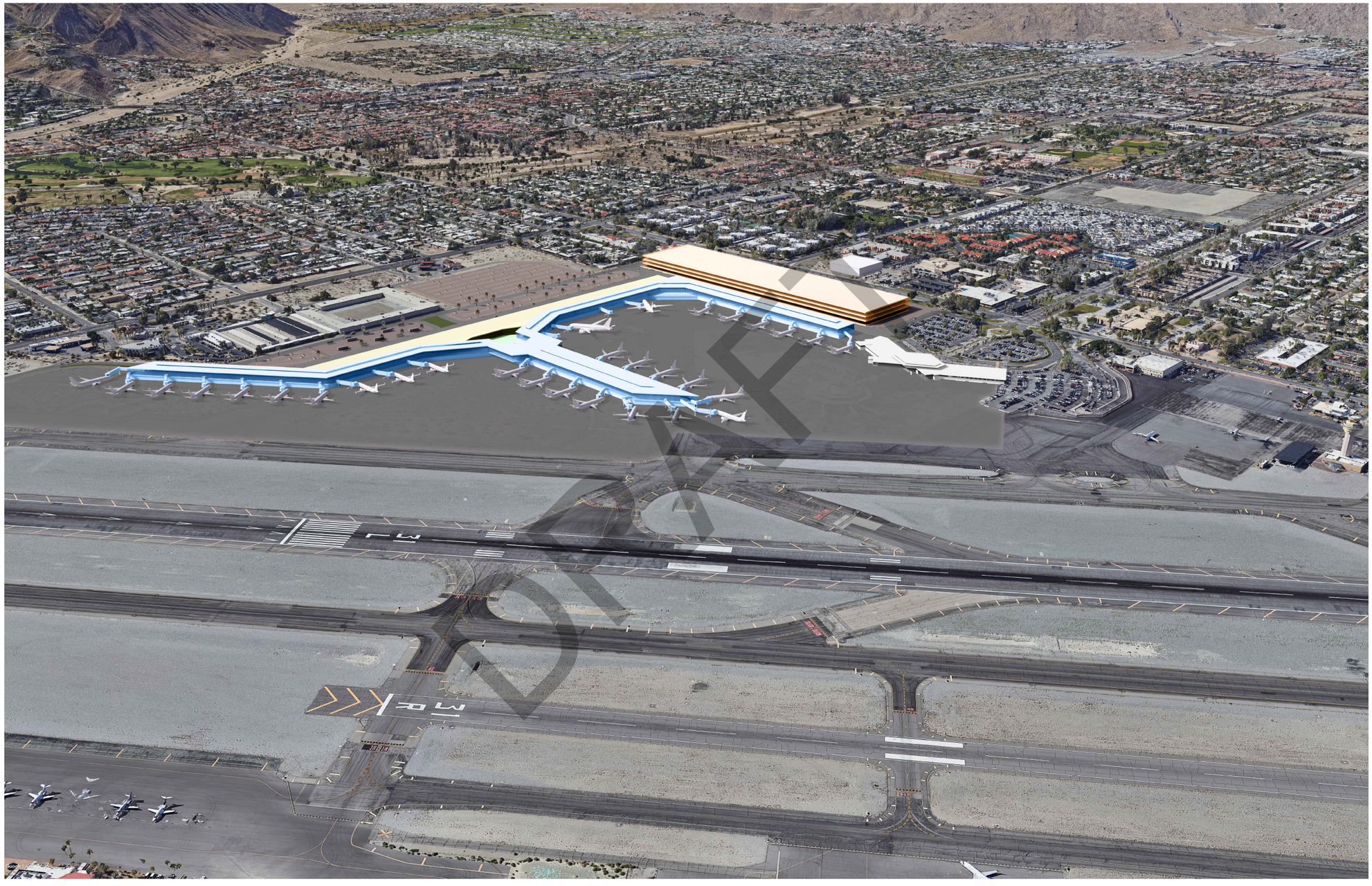
Figure 4-20: Alternative 1A Southwest View

***Source**: Gensler, 2023*

Figure 4-21: Alternative 1A Tahquitz View

***Source**: Gensler, 2023*

Figure 4-22: Alternative 3 Northeast View



***Source**: Gensler, 2023*

Figure 4-23: Alternative 3 Southeast View

***Source**: Gensler, 2023*

EQUITY AND SUSTAINABILITY CONSIDERATIONS

In either of the previously described concepts, the goal would be the design of an effective, efficient and sustainable terminal. To create a sustainable airport terminal, a range of factors pertaining to land use, transportation, stakeholder relations, and resilience should be considered in the design process. The objective being to develop the terminal improvements in phases that seamlessly integrate the surrounding environment, supports the well-being of stakeholders, and is resilient to challenges.

Building a terminal that incorporates equity and sustainability creates a space that attempts to address the needs of all stakeholders while minimizing environmental impacts. The following sections explain equity and sustainability factors that were taken into consideration when choosing the refined alternatives.

Equity Factors:

- **Accessibility for All:** Ensures the terminal is accessible to individuals of all abilities. Incorporates ramps, elevators, tactile indicators, limits walking distance and other features that make navigation easy for people with disabilities.
- **Inclusive Design:** Creates spaces that are inclusive of diverse cultural backgrounds and age groups. Consider cultural sensitivities, multilingual signage, and spaces that accommodate families, children, and elderly travelers.
- **Economic Accessibility:** Ensures there are services and amenities that cater to different income levels. Offers affordable transportation options, varied dining choices, and amenities that can be enjoyed by all passengers.
- **Community Engagement:** Involve local communities and stakeholders in the design process. Seek input from residents, businesses, and community organizations to ensure the terminal's design reflects their needs and concerns.
- **Employment Opportunities:** Consider how the terminal improvements can create job opportunities for the local community, especially in marginalized neighborhoods. Collaborate with community organizations to provide training and employment initiatives.
- **Environmental Justice:** Assess the potential environmental impacts of the terminal on surrounding communities, particularly those that are historically disadvantaged. Mitigates negative impacts and ensure that benefits are distributed equitably.

Consider a terminal design that will lessen confusion for passengers during construction and create a streamlined experience.

Sustainability Factors:

- **Energy Efficiency:** Prioritizes energy-efficient design, utilizing advanced lighting, heating, cooling, and ventilation systems. Implements sensors and automation to optimize energy use.
- **Renewable Energy:** Integrates renewable energy sources like solar panels to power the terminal. Utilizes clean energy technologies to reduce reliance on fossil fuels.
- **Water Management:** Implements water-efficient fixtures and systems to minimize water consumption. Incorporates rainwater harvesting and greywater recycling to further conserve water resources.
- **Materials Selection:** Chooses sustainable and eco-friendly materials with a low environmental impact. Prioritizes materials that are recycled, recyclable, or biodegradable.
- **Waste Management:** Designs include waste disposal and recycling facilities that encourage proper waste segregation. Promotes waste reduction through initiatives like composting and recycling programs.
- **Transportation Alternatives:** Improves access to public transportation and consider on-site electric vehicle charging stations. Encourages travelers to use low-carbon transportation options.
- **Biodiversity:** Incorporates green spaces and native vegetation into the terminal design to support local biodiversity. Uses landscaping techniques that require minimal water and maintenance.
- **Resilience to Climate Change:** The terminal is designed to withstand the impacts of climate change and extreme weather events.
- **Lifecycle Assessment:** Considers the entire lifecycle of the terminal, from construction to operation and eventual decommissioning. Minimize environmental impacts at every stage.
- **Certification and Standards:** Strives for sustainability certifications such as LEED (Leadership in Energy and Environmental Design) or BREEAM (Building Research Establishment Environmental Assessment Method) to ensure that the terminal meets internationally recognized sustainability criteria.

Lifecycle Assessment: Contemplate a terminal design that creates the most opportunities for the longevity and sustainability of the historic Wexler Terminal.

The aspiration for a sustainable airport terminal design is a holistic one. It encompasses social equity, energy efficiency, water conservation, waste management, stakeholder engagement, and resilience as well as environmental and financial uncertainties. Through a careful synthesis of these elements, PSP endeavors to create a terminal that not only meets the needs of its users but also serves as a model of sustainable design for the broader aviation industry and the entire Coachella Valley.

Appendix A – Regional and Macroeconomic Environment

OVERVIEW

Demographic and economic conditions influence the demand for air travel. They are particularly important for airports like PSP, which serves primarily origin and destination (O&D) traffic—passengers that either begin or end their flight itineraries at the airport. Healthy demographic and economic conditions promote increased business and leisure air travel. In addition, macroeconomic trends drive demand for air travel and affect state and regional economies. At the regional level, demographic and economic factors determine residents' demand for outbound travel and the region's attractiveness to visitors. This section explores the demographic and economic trends in PSP's service area, California, and the United States. It also evaluates the economic outlook for both the region and the nation.

Over the past two years, the world faced the COVID-19 pandemic, which disrupted day-to-day life and economic activities across the globe. Although the World Health Organization (WHO) has declared the end of the COVID-19 pandemic and state of global public health emergency, its effects show in the trends of key economic indicators discussed in this section.

COVID-19 PANDEMIC

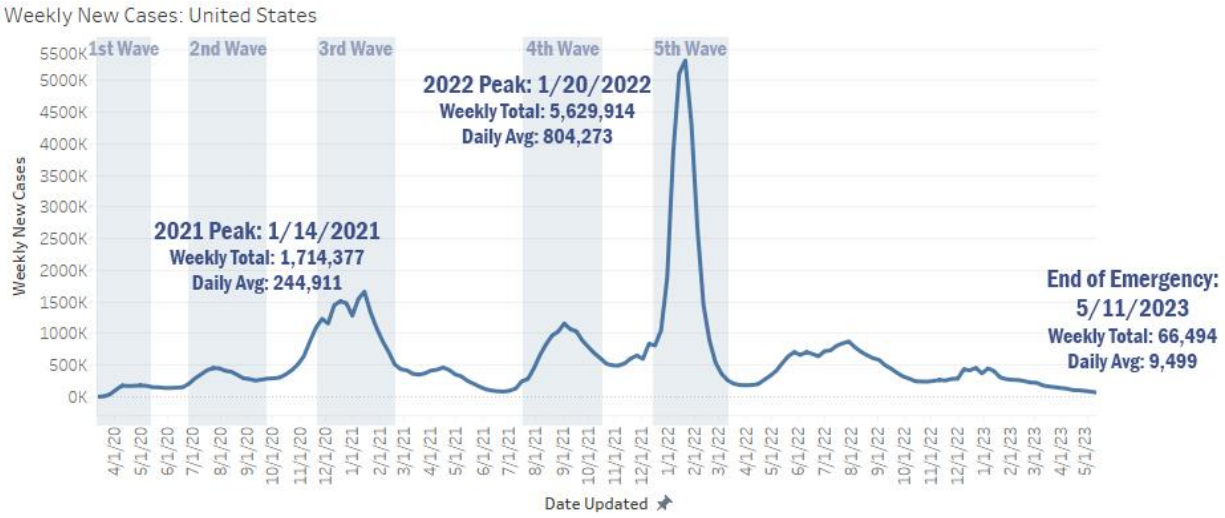
In December 2019, the COVID-19 virus first surfaced in China. It quickly spread worldwide, including to the United States, where the first case was identified in mid-January 2020. The virus was declared a global pandemic in March 2020, prompting a national emergency declaration in the United States. Despite efforts to contain the virus through travel restrictions, stay-at-home orders, and social distancing measures, several waves of infection hit the United States. The fifth wave, which began in November 2021 and peaked on January 20, 2022, holds the record for the highest reported cases—over three times higher than the previous peak during the third wave in early 2021. The fifth wave subsided quickly, and new cases have since been on a downward trend despite a mild surge through the summer of 2022. As of May 2023, COVID-19 has infected over 99.7 million people and caused more than 1.1 million deaths in the United States.

So far through 2023, infections have continued to decrease steadily. The U.S. Department of Health and Human Services has ended the COVID-19 Public Health Emergency as of May 11, 2023.[1] **Figure A-1** shows the reported COVID-19 cases throughout the history of the COVID-19 pandemic, from the WHO's

[1] Centers for Disease Control and Prevention, "Evolution of Pandemic Efforts," *COVID Data Tracker Weekly Review*, February 24, 2023, https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html.

announcement of COVID-19 as a global pandemic on March 11, 2020, to its end as a public health emergency in the United States on May 11, 2023.

Figure A-1 COVID-19: United States Weekly New Cases, March 2020–May 11, 2023



Source: *Centers for Disease Control and Prevention COVID Data Tracker.*

The administration of initial COVID-19 vaccines and subsequent booster shots helped slow virus transmission and alleviated symptoms. As of March 2023, about 230.6 million people in the United States are fully vaccinated (69.5 percent of the population), and 56.4 million have received an updated bivalent booster dose. California has a higher vaccination rate: 29.6 million are vaccinated (74.9 percent of state residents), and about 8.1 million have received an updated bivalent booster dose. As initial vaccinations and boosters have been widely available to U.S. residents for some time, it is highly likely that most residents who want and can be vaccinated already are. While vaccines do not provide complete protection, fewer people are likely to get exposed to the virus as more people are vaccinated.[2]

AIR SERVICE AREA

The Airport's primary air service area is the Riverside-San Bernadino Metropolitan Statistical Area (Riverside MSA, MSA), which is shown in **Figure A-2**. The MSA is comprised of two counties: Riverside and San Bernadino. The Airport is in the Coachella Valley in central Riverside County near Palm Springs, Rancho Mirage, and Desert Hot Springs. In Riverside County, the communities of Indio, Coachella, and La Quinta are to the southeast and Riverside, Temecula, and Moreno Valley are to the west. In San Bernardino County, the communities of Ontario and San Bernadino are to the northwest and Yucca Valley and Twentynine Palms are to the north. Palm Springs is a western gateway to Joshua Tree National Park, and

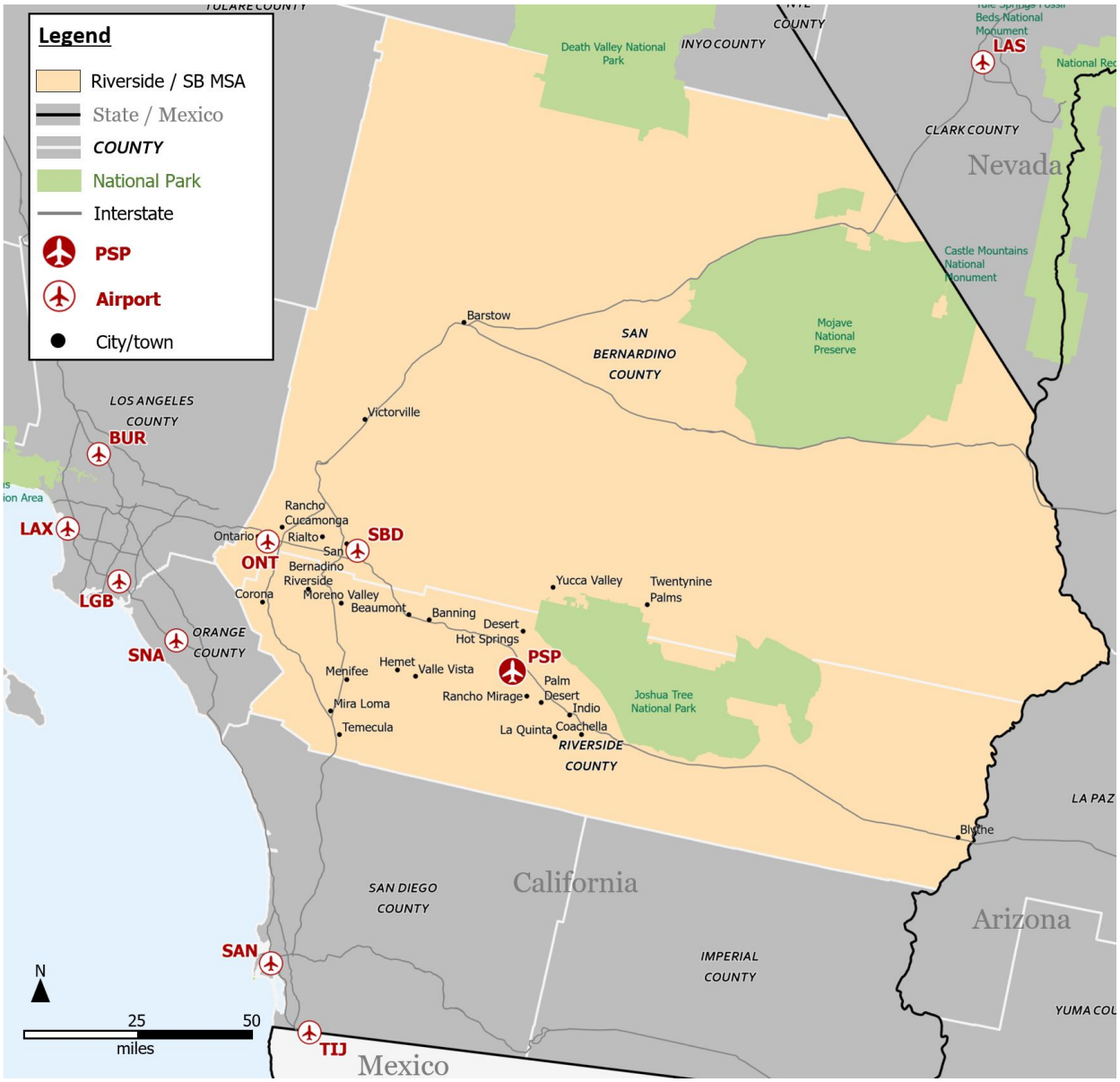
[2] World Health Organization, "Vaccine efficacy, effectiveness and protection," *Vaccines Explained*, July 14, 2021, https://www.who.int/news-room/feature-stories/detail/vaccine-efficacy-effectiveness-and-protection.

Interstate 10 provides a major east-west surface route to the greater Los Angeles area to the west and Phoenix to the east.

PSP operates in relative market isolation locally, but there are several competing airports within a 3-hour drive, as shown in **Figure A-3** and **Table A-1**. **Figure A-3** shows PSP's 60-, 90-, and 120-minute drive time regions. There are no other commercial service airports within a 1-hour drive to PSP. San Bernadino International Airport (SBD) is the closest (1 hour 3 minutes) but has nonstop service only to San Francisco (SFO) and Las Vegas' Harry Reid (LAS) international airports. Ontario International Airport (ONT) is approximately 1 hour and 20 minutes away. In the Los Angeles area, Orange County's John Wayne (SNA), Long Beach (LGB), Los Angeles International (LAX), and Hollywood Burbank (BUR) airports present options, but they require at least a 2-hour drive. To the south, San Diego International Airport (SAN) is approximately 2 hours and 20 minutes from PSP. Travelers can also use the Cross Border Xpress to fly across the Mexican border from Tijuana International Airport (TIJ). However, TIJ is about 2.5 hours from PSP, primarily serves destinations in Mexico, and requires passengers to undergo screening associated with international border crossings.

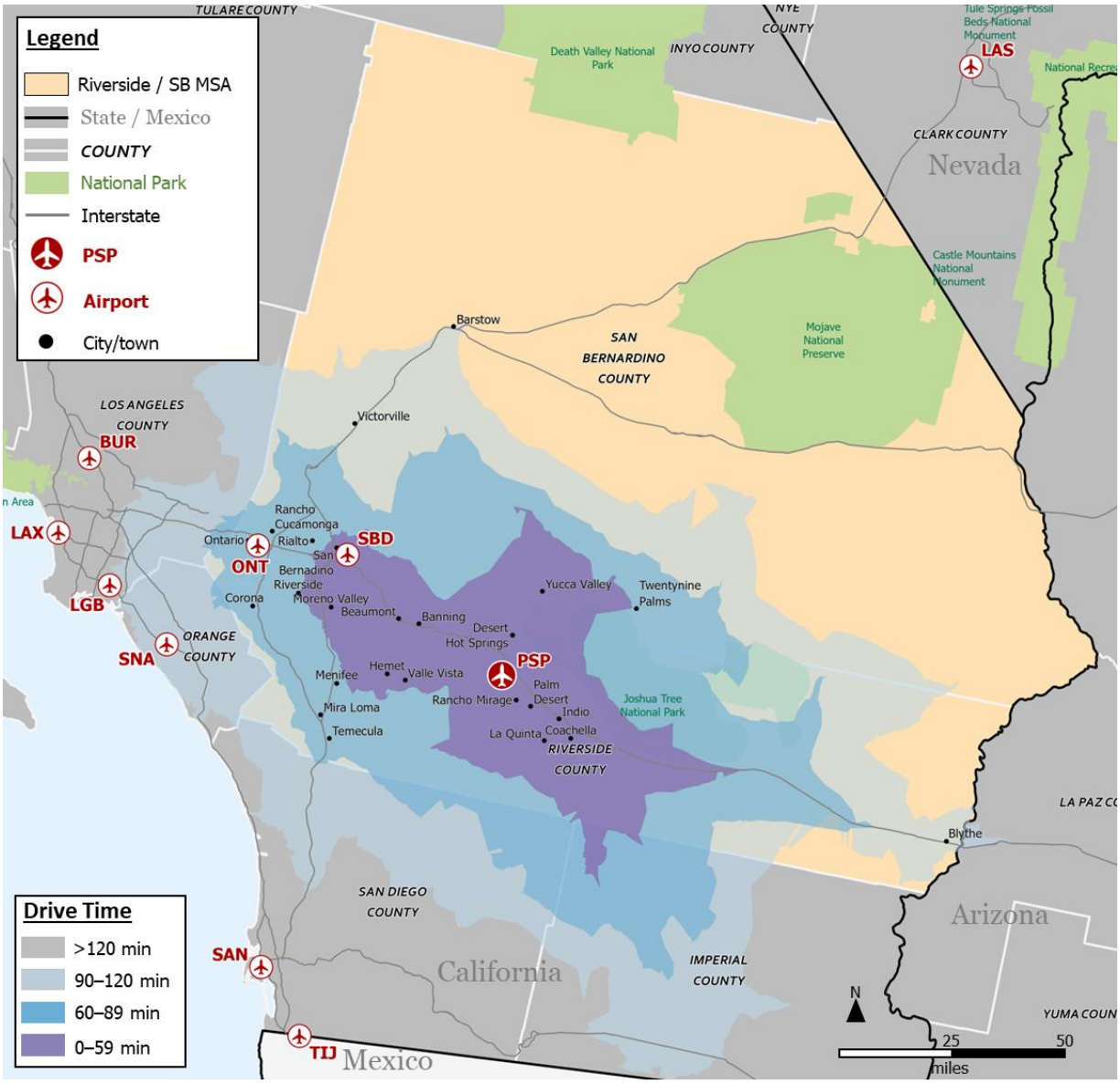
Despite their distance, larger airports like LAX, SAN, SNA, and ONT compete significantly with PSP because they offer more flight options. Nevertheless, the Airport has performed well. Among the Southern California airports, PSP recorded the highest pre-pandemic enplanement growth (6.4 percent annually from 2010-2019) and the fastest recovery from the pandemic downturn. PSP ended 2022 at 17 percent **above** 2019 enplanement level, while other airports in the region trailed far behind—in particular, LAX at 25 percent, SAN at 12 percent, and LGB at 9 percent **below** their 2019 levels.

Figure A-2 **PSP Air Service Area**



Sources: *Esri and Unison Consulting, Inc.*

Figure A-3 Drive Time to PSP



Sources: Esri and Unison Consulting, Inc.

Table A-1 Selected Commercial Service Airports in Southern California and Northern Mexico

Airport Information				2022		2019		2010	Distance from PSP	
Name	State	Code	FAA Category	EP (1000s)	2019-2022 % Change	EP (1000s)	2010-2019 CAGR	EP (1000s)	Miles	Time
Palm Springs International	CA	PSP	Small	1,501	17%	1,287	6.2%	750	0	0
San Bernadino International	CA	SBD	GA	0	--	0	--	0	57	1h 3m
Ontario International	CA	ONT	Medium	2,835	4%	2,717	1.5%	2,371	74	1h 22m
John Wayne, Orange County	CA	SNA	Medium	5,494	7%	5,150	2.1%	4,277	99	1h 51m
Long Beach	CA	LGB	Small	1,594	-9%	1,749	2.1%	1,447	112	2h 3m
Hollywood Burbank	CA	BUR	Medium	2,949	-1%	2,985	3.3%	2,235	122	2h 10m
Los Angeles International	CA	LAX	Large	32,275	-25%	42,940	4.5%	28,828	124	2h 18m
San Diego International	CA	SAN	Large	11,122	-12%	12,625	4.6%	8,456	144	2h 22m
Tijuana International	BN, MEX	TIJ	--	6,162	38%	4,463	10.4%	1,825	158	2h 36m

Sources: *FAA, Grupo Aeroportuario del Pacifico, Google Maps, and Unison Consulting, Inc.*

Notes: *Drive times vary by day, time of day and traffic.*

FAA airport hub classification:

- *Nonhubs serve less than 0.05 percent of the annual U.S. total and more than 10,000 enplanements.*
- *Small hubs serve 0.05-0.25 percent of U.S. enplanements.*
- *Medium hubs serve 0.25-1.0 percent of U.S. enplanements.*
- *Large hubs serve more than 1 percent of U.S. enplanements.*
- *Enplanement data for TIJ are calculated as 50 percent of total annual airport activity.*
- *SBD was considered a General Aviation (GA) airport in 2010, 2019, and 2021. GA airports have no scheduled service or less than 2,500 boardings per year. SBD gained service from Breeze Airways in August 2022, and enplaned 9,122 (domestic) passengers in 2022. Bureau of Transportation airport classifications and rankings for 2022 are not yet available.*

DEMOGRAPHIC ATTRIBUTES

Demographics shape and drive regional economies in fundamental ways. For example, population size, growth trends, age distribution, foreign-born population, and educational attainment determine the labor force's size, quality, and productivity. Moreover, along with income characteristics, demographic attributes determine consumption patterns and demand levels for goods and services, including air transportation. Hence, demographic trends can impact economic growth through effects on both the supply side (the labor force) and the demand side (consumer spending).

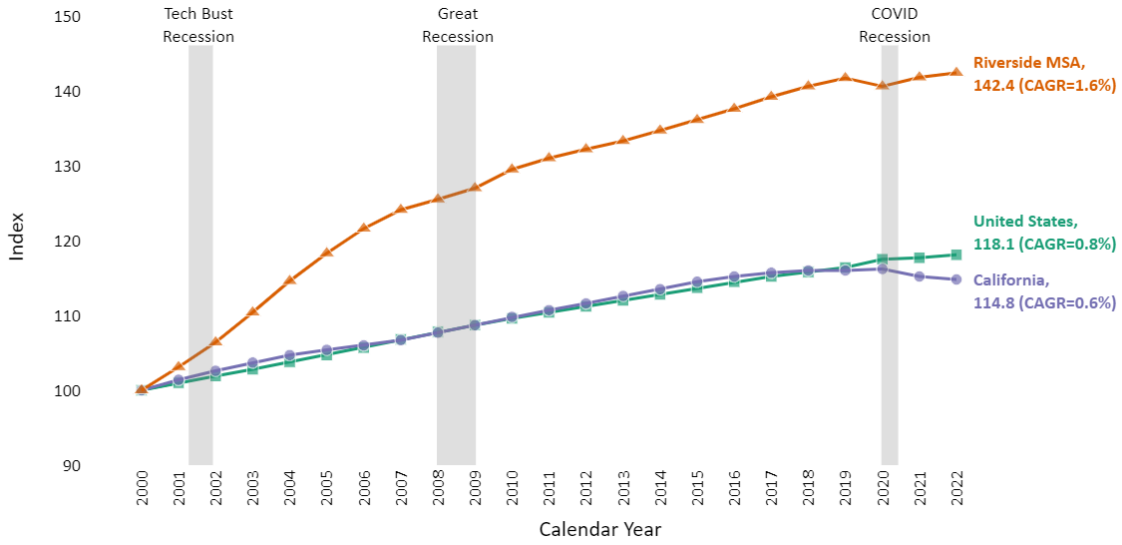
Population

In 2021, the Riverside MSA was the 12th largest (out of 384) MSA in the United States, with a population of about 4.7 million—similar in size to Boston, MA and Detroit, MI.[3] Riverside County accounts for approximately 53 percent of the MSA's population, and San Bernadino County the remaining 47 percent. Since 2000, the population of the MSA has grown much faster than California or the United States. This

[3] MSA population data for 2022 was not available at the time of writing.

trend is displayed in **Figure A-4**. Between 2000 and 2022, the population of the Riverside MSA grew by a total of 42 percent, at a CAGR of 1.6 percent. In contrast, the national population grew by just 18 percent (0.8 percent CAGR), and the population of California grew by only 15 percent (0.6 percent CAGR).

Figure A-4 Population Index (2000=100), 2000-2022

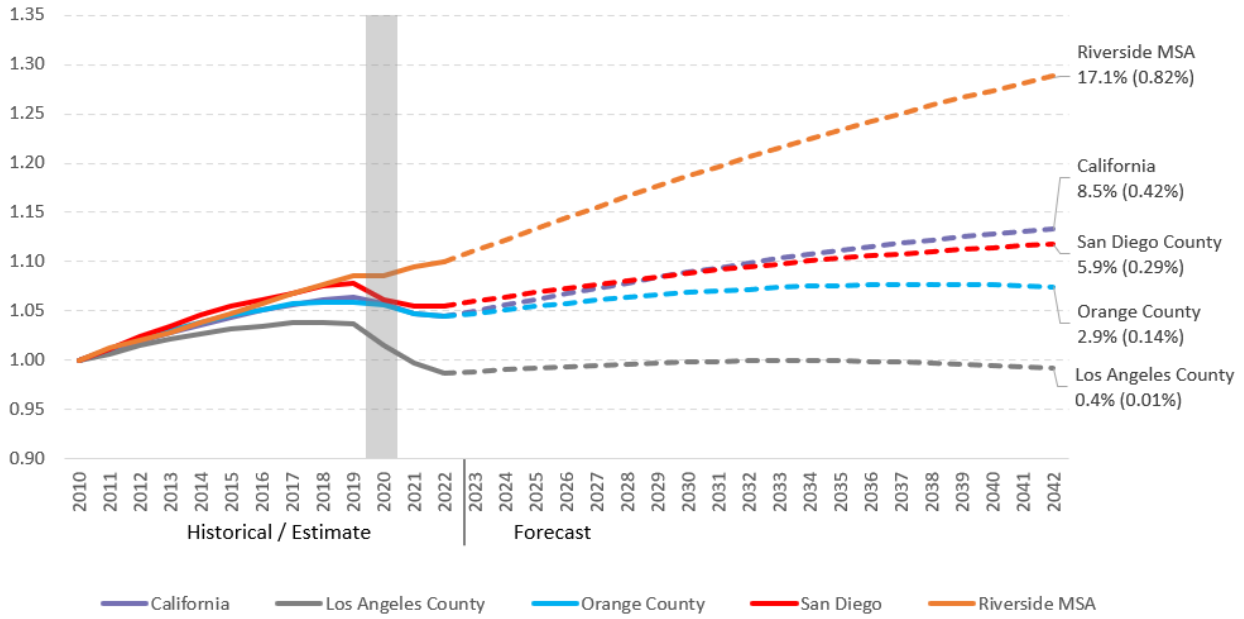


Sources: *U.S. Census Bureau and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

According to forecasts in **Figure A-5**, population growth in the Riverside MSA will continue faster than surrounding areas in the coming decades. From 2022 to 2042, the population of the Riverside MSA will increase by 17 percent, with a yearly growth rate of 0.8 percent. California's population will grow by only 9 percent (0.4 percent CAGR). The surrounding counties will grow even slower: San Diego County by 5.9 percent overall (0.3 percent CAGR), Orange County by 2.9 percent (0.1 percent CAGR), and Los Angeles County by 0.4 percent (0.01 percent CAGR). Population growth leads to an increase in airport traffic.

Figure A-5 Long-Term Population Forecast (Index=2010), Riverside MSA, Surrounding Counties, and California, 2023-2043



Sources: *U.S. Census Bureau, State of California Department of Finance, and Unison Consulting, Inc.*

Notes: *Gray areas are economic recession periods. Percentages are total 2023-243 growth rates (CAGR in parentheses). Data are California or Census estimates through 2022. Forecasts are generated by applying the CA Dept. of Finance forecast growth rates to future years.*

Population Age Structure

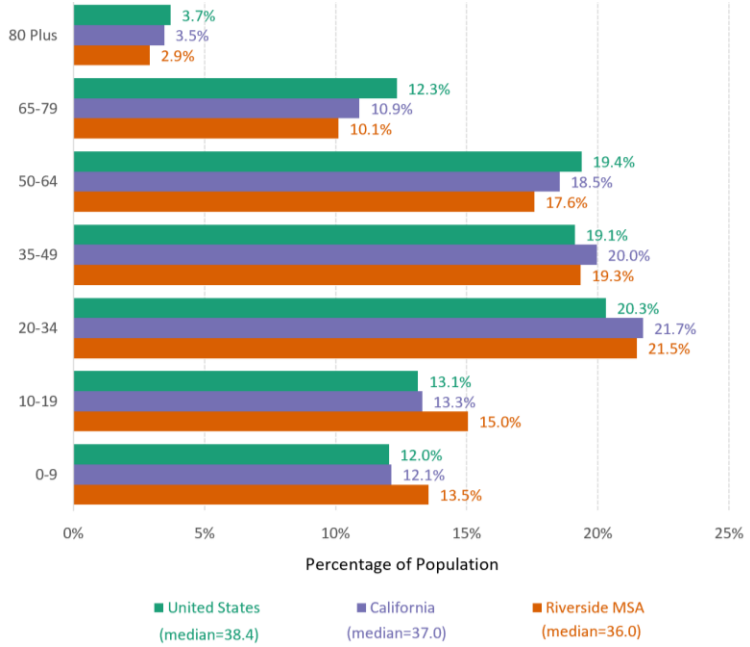
A region's population distribution by age has important economic and social implications. In 2021, approximately 58 percent of the Riverside MSA was in the primary working age cohort of 20 to 64 years of age, similar to that of the nation (59 percent) and California (60 percent). A large working-age population is important in maintaining a vibrant local economy and a high standard of living. **Figure A-6** presents the population age structure of Riverside County.

The median age of the Riverside MSA is slightly lower (36 years) than the median age of California (37 years) and the United States (38.4 years). This is reflected in the relatively higher percentage of residents that are 19 years of age or younger. However, the MSA population is aging faster over time. Between 2010 and 2021, the median age in the Riverside MSA increased by 3.7 years compared with 2.1 years in California and 1.5 years nationally.[4] While these changes may be small, they indicate an ongoing population maturation—which has important implications for economic growth. The working-age population needs to grow for the labor force and the economy to grow. In the Riverside MSA, the share of the working-age population has increased from about 57 percent to its current level (58 percent) – a positive trend running counter to national patterns. However, the rapid increase in the median age of the

[4] U.S. Census Bureau 2021 and 2010 American Community Survey 5-year Estimates.

MSA may reverse the growth in the working-age population in the coming years. Productivity improvements can counter slowing growth in the working-age population through upskilling the labor force, education, and technological advancements.

Figure A-6 Population Age Structure, 2021



Sources: *U.S. Census Bureau 2021 American Community Survey and Unison Consulting, Inc.*

Foreign-Born Population

Amid an aging population and declining national birth rates, attracting in-migration offers another way to increase the population, expand the labor force, and support economic growth. Immigrants add to a region's labor supply, contribute to increasing productivity, and expand the regional market for goods and services.[5, 6] Immigrants also generate demand for air service—for their travel to visit family and friends in their region of origin, and, from their family and friends coming to visit the United States.

The Riverside MSA has a relatively large and stable foreign-born population. In 2021, approximately 21 percent of the Riverside MSA's residents were born outside the United States, lower than California's share (27 percent) but much higher than the national share (14 percent). Among the foreign-born population groups in the Riverside MSA, the largest came from Latin America (69 percent), followed by Asia (23 percent) and Europe (4 percent). This distribution by region of foreign origin in the Riverside MSA is more heavily weighted towards Latin America than the national and state distributions. The percentage

[5] G.J. Borjas, "Immigration and Economic Growth," National Bureau of Economic Research *Working Paper Series*, Working Paper 25836, May 2019, https://www.nber.org/system/files/working_papers/ w25836/w25836.pdf.

[6] P. Orrenius and C. Smith, "Without Immigration, U.S. Economy Will Struggle to Grow," *Dallas Fed Economics*, Federal Reserve Bank of Dallas, April 9, 2020, https://www.dallasfed.org/research/economics/2020/ 0409.

of foreign-born Riverside MSA residents had remained nearly the same since 2010 (when it was 22 percent). **Table A-2** discusses the percentage of foreign-born populations in the United States, California, and the Riverside MSA.

Table A-2 Foreign-Born Population, 2021

Region	Foreign Born	Percentage by Region of Origin					
	Total	Europe	Asia	Africa	Oceania	Latin America	Northern America
United States	13.6%	10.8%	31.2%	5.5%	0.6%	50.0%	1.8%
California	26.5%	6.5%	40.0%	2.0%	0.8%	49.5%	1.2%
Riverside MSA	21.1%	3.8%	23.3%	2.2%	0.3%	68.9%	1.5%

Sources: *U.S. Census Bureau 2020 American Community Survey and Unison Consulting, Inc.*

Educational Attainment

Education promotes economic growth in several ways. First, education increases the value of human capital and labor productivity. Second, it promotes innovation and the adoption of new technologies. Third, it provides flexibility to adapt to changing work environments and skill requirements.[7, 8]

Advancements in information and communication technologies have amplified the role of workers' skills in generating economic growth.[9] Cities and regions that have been able to attract and retain educated and skilled workers have thrived, while cities failing to do so have lagged.[10] The value of education is evident in the disparities in average wages and unemployment rates by educational attainment. Workers who have not completed high school earn only 44 percent of the wages earned by college graduates. They also have unemployment rates that are more than two times higher.[11]

Educational attainment levels in the Riverside MSA are somewhat lower than state and national levels, as shown in **Figure A-7**. Just 24 percent of the population aged 25 and over in the Riverside MSA have at least a bachelor's degree, compared with 35 percent in the State of California and 34 percent nationally. The percentage of the population 25 years and over in the Riverside MSA with less than a high school degree is nearly 18 percent, higher than California's 16 percent and the nation's 11 percent.

Over time, however, educational attainment levels in the Riverside MSA are improving. Since 2010, the number of residents aged 25 and over with less than a ninth-grade education has fallen by 14 percent,

[7] E. Hanushek and L. Woessman, "Education and Economic Growth," *International Encyclopedia of Education* (Oxford: Elsevier, 2010), Vol. 2, pp. 245-252.

[8] D. Claude and L. Charlotte, "Human Capital and Economic Growth," *Encyclopedia of International Higher Education Systems and Institutions* (Dordrecht: Springer, 2019).

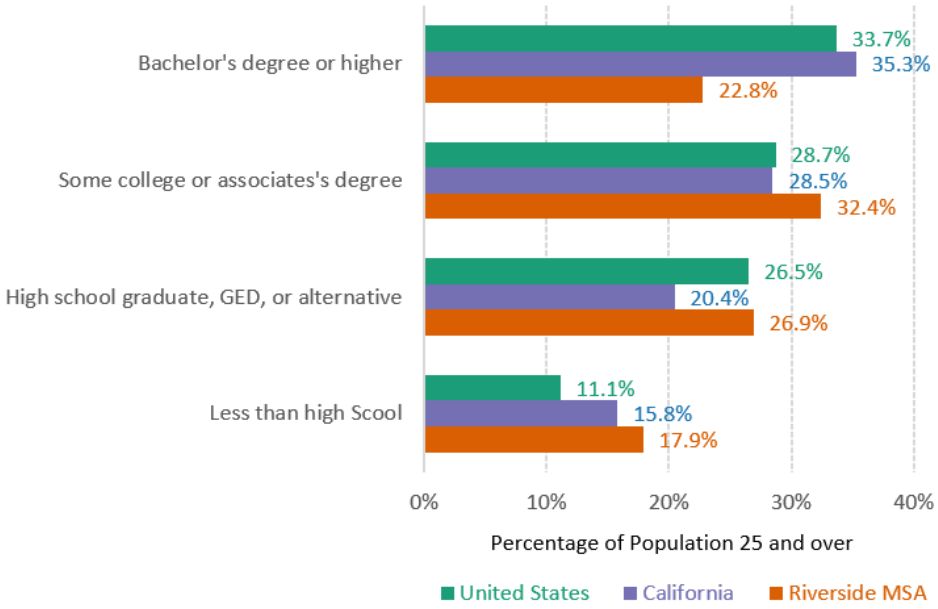
[9] Enrico Moretti, *The New Geography of Jobs* (Boston: Houghton Mifflin Harcourt, 2012).

[10] Edward Glaeser, *Triumph of the City* (New York: Penguin Books, 2012).

[11] Elka Torpey, "Measuring the Value of Education," U.S. Bureau of Labor Statistics, April 2018, https://www.bls.gov/careeroutlook/2018/data-on-display/education-pays.htm.

and those with some high school but no diploma has fallen by about 20 percent. Meanwhile, the percentage of residents with a bachelor's degree has risen by 16 percent and those with a graduate or professional degree by 20 percent.[12] Continued improvements in educational attainment and the upskilling of the local workforce are critical for maintaining and enhancing regional economic competitiveness in the Riverside MSA.

Figure A-7 Educational Attainment, 2021



Sources: *U.S. Census Bureau 2021 American Community Survey and Unison Consulting, Inc.*

Note: *Percentage of population aged 25 and over.*

Income

Demand for air travel increases with income. Studies suggest that air travel demand income elasticities are often greater than one. This means that air travel increases by more than a corresponding increase in income, holding all other things equal.[13]

As referenced in **Figure A-8**, household incomes in the Riverside MSA are lower than the rest of California but higher than the nation. The median household income in the Riverside MSA is 73,742 dollars, 6.4 percent higher than the national average (69,061 dollars) but 12.7 percent below the California average (84,097 dollars). The Riverside MSA has a lower percentage of households earning at least 100,000 dollars compared with the state of California and a higher percentage of households earning very low incomes (below 25,000 dollars).

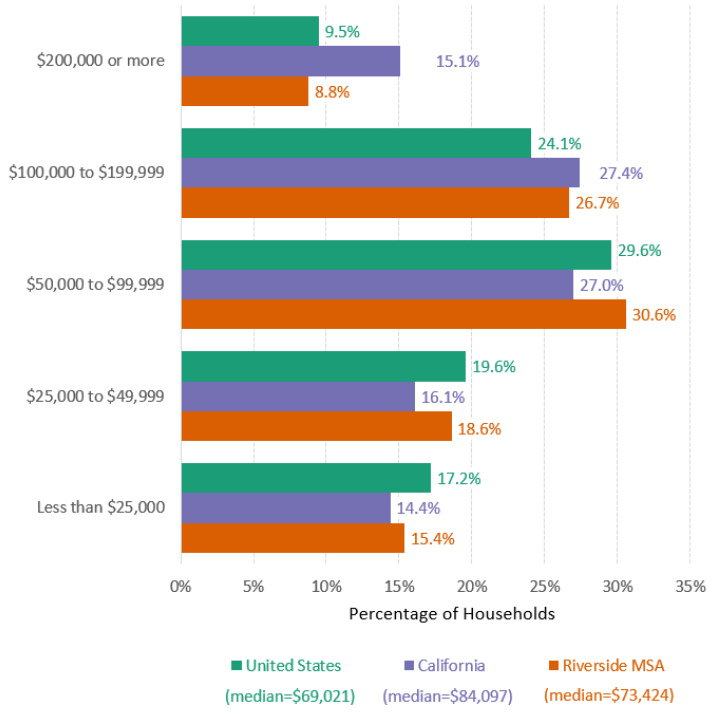
[12] U.S. Census Bureau 2021 and 2010 American Community Survey 5-year Estimates.

[13] For example, a 10 percent increase in income will generate more than a 10 percent increase in air travel demand. See C. A. Gallet and H. Doucouliagos, "The income elasticity of air travel: A meta-analysis," *Annals of Tourism Research* 49 (2014), 141-155.

The Riverside MSA has enjoyed steady per capita personal income growth since 2001, experiencing only a small dip during the Great Recession, as illustrated in **Figure A-9**. Per capita personal income in the Riverside MSA increased at a compound annual growth rate of 3.6 over the past two decades—a rate like that of the nation (3.6 percent) but slightly lower than the state of California (4.1 percent).

Despite the growth, since 2001, per capita personal income has been consistently lower in the Riverside MSA than both the nation and the state. In 2021, per capita personal income in the Riverside MSA (50,384 dollars) was almost 14,000 dollars lower than the national average (64,514 dollars) and more than 26,000 dollars lower than the California state average (76,614 dollars). The gap in per capita personal income between the Riverside MSA and the state has widened over time—in 2021, per capita personal income in California MSA was 52 percent higher than the Riverside MSA compared with a difference of 38 percent in 2001. Income inequality is a national issue that may impact economic opportunity, financial security, and mobility. It is a problem that has been noted both in California and in the Palm Springs region.[14,15,16]

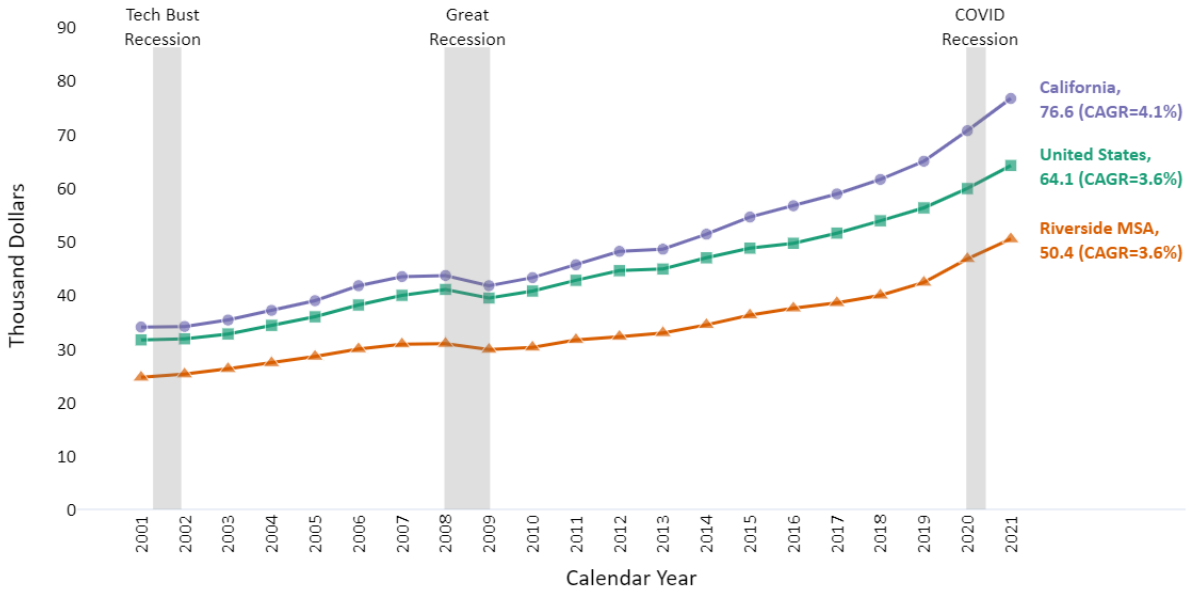
Figure A-8 **Household Income Distribution and Median Household Income, 2021**



Sources: *U.S. Census Bureau 2020 American Community Survey and Unison Consulting, Inc.*

[14] Pew Research Center, https://www.pewresearch.org/social-trends/2020/01/09/trends-in-income-and-wealth-inequality/.
[15] Public Policy Institute of California, https://www.ppic.org/publication/income-inequality-in-california/.
[16] Coachella Valley Economic Partnership, http://cvep.com/wp-content/uploads/2019/11/ CVEP_2019_ EconomicReport_FINAL.pdf.

Figure A-9 Per Capita Personal Income, 2001-2021



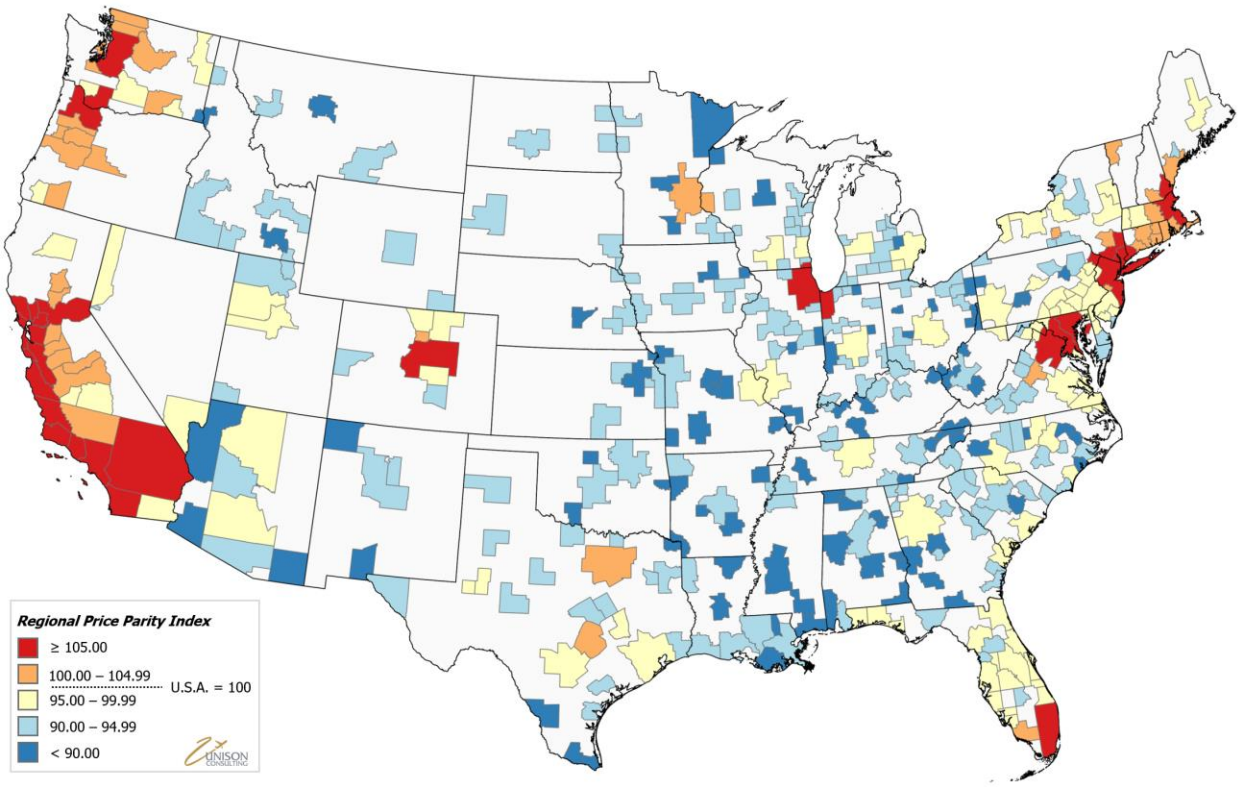
Sources: *U.S. Bureau of Economic Analysis and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Cost of Living

Compared to the national average, living in the Riverside MSA is expensive. MSA's regional price parity index for 2021 shows that prices in the Riverside MSA are about 6 percent above the U.S. average. However, compared with the neighboring Los Angeles and San Diego MSAs, where prices are 14 and 15 percent above the national average, the cost of living is low in the Riverside MSA. Nationally, other MSAs with a comparable cost of living include Baltimore, MD, and Bridgeport, CT. All things equal, lower average prices give consumers more discretionary income to spend on travel. **Figure A-10** presents the nationwide price parity by MSA.

Figure A-10 Regional Price Parity Index by MSA (U.S. MSA Average = 100), 2021



Sources: *U.S. Bureau of Economic Analysis and Unison Consulting, Inc.*

ECONOMIC ATTRIBUTES

Demand for air transport services is a function of the economic vitality of a region, which can be gleaned from trends in gross domestic product (GDP), the labor market, the mix of industries that make up the regional economy, and tourism. Regional, national, and even global economic conditions influence the demand for air transportation services at a particular airport.

Gross Domestic Product

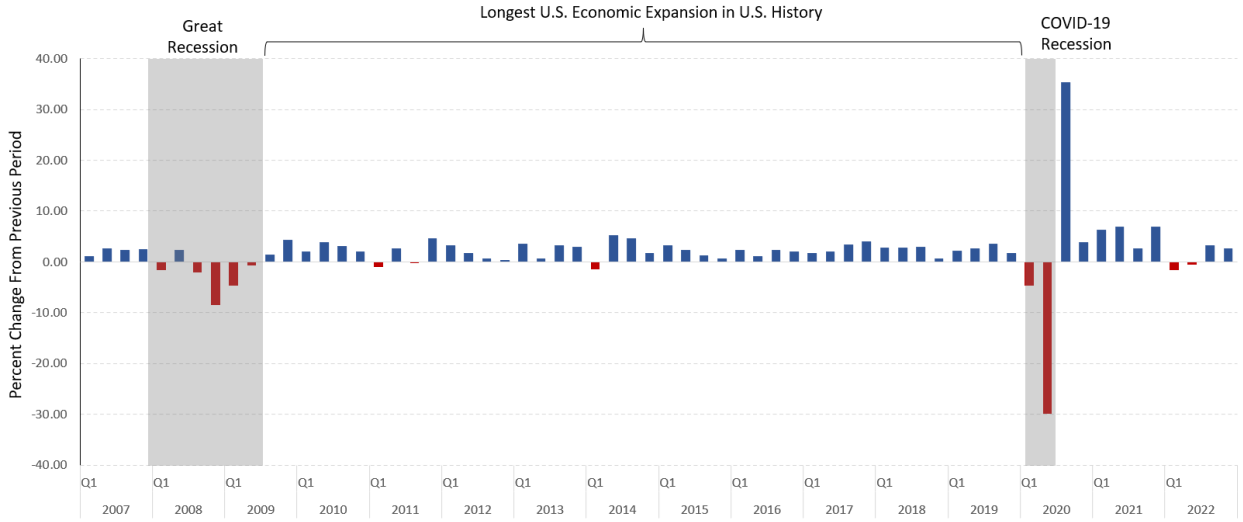
The most comprehensive measure of economic output is GDP—the dollar value of all goods and services produced in a geographic region.[17] Sustained growth in inflation-adjusted real GDP underpins economic expansions, while decreases in real GDP over two or more consecutive quarters often signal a recession.[18] Generally, during an economic expansion, employment grows, incomes rise, and the demand for air travel also rises. Conversely, during an economic recession, employment decreases, incomes fall, and the demand for air travel also falls.

[17] In this report, GDP refers to economic output measured at both national and sub-national levels.
[18] The National Bureau of Economic Research (NBER) Business Cycle Dating Committee officially determines recessions.

When the COVID-19 pandemic struck the United States in the first quarter of 2020, widespread lockdowns, stay-at-home orders, and voluntary social distancing depressed consumer spending, causing the economy to fall into a deep recession. In 2020 U.S. real GDP decreased by 4.6 percent (annual rate) in the first quarter and another 29.9 percent in the second quarter. The magnitude of the overall contraction in U.S. real GDP was unprecedented. The second-quarter contraction alone was at least three times the GDP contraction during the 2008-2009 Great Recession. **Figure A-11** charts the national average GDP.

The 2020 recession was different from previous U.S. economic recessions. The typical causes of recessions are market-related and economic in nature—for example, asset market crashes, oversupply, loss of consumer and business confidence, or tight monetary and fiscal policy. The 2020 recession resulted from shocks to both supply and demand induced by the pandemic and deliberate measures to contain COVID-19. Therefore, when counties and states began to reopen in the second half of 2020 and social distancing began to ease, the U.S. real GDP rebounded quickly, increasing 35.3 percent in the third quarter and 3.9 percent in the fourth quarter. Vaccination helped restore consumer and business confidence, accelerate business re-openings, and sustain the economic recovery in 2021. U.S. real GDP grew 5.9 percent throughout the entire year, the highest annual increase since 1978.

Figure A-11 U.S. Real GDP, Quarterly, Annualized Percent Change from Previous Period, 2002-2022



Sources: *U.S. Bureau of Economic Analysis and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Trends changed in 2022. The U.S. real GDP declined during the first two quarters—by 1.6 percent during the first quarter and 0.6 percent during the second quarter. GDP decreased due to supply and demand issues. On the supply side, production lagged due to (1) the fifth and highest wave of COVID-19 infections from the Omicron variant; (2) supply-chain bottlenecks and inventory pressures; and (3) a fundamental tightness in the labor market due to demand far exceeding labor supply. On the demand side, growth slowed due to (1) the disappearing stimulus from household income transfers, (2) reduced government

spending, (3) rising interest rates due to monetary tightening to contain inflation, and (4) the decrease in exports due to the appreciation of the U.S. dollar.

GDP decline in two consecutive quarters typically would have signaled a recession. However, the NBER Business Cycle Dating Committee, the official arbiter of U.S. business cycles, also looks at trends in other key economic indicators such as nonfarm employment, real consumer spending, industrial production, and real personal income. These indicators, which were generally increasing, did not signal a recession, which the NBER defines as a "significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in production, employment, real income, and other indicators." During the third quarter of 2022, the U.S. real GDP grew by 3.2 percent, and during the fourth quarter GDP grew by 2.6 percent. The advance estimates for GDP growth in the first quarter of 2023 indicates further slowing to 1.1 percent.

Measured by real GDP, business cycle changes at the state and MSA levels generally follow national trends, as displayed in **Figure A-12**. Over the long-term, growth in real GDP in the Riverside MSA has matched that of California and exceeded that of the United States. Between 2002 and 2007, just prior to the Great Recession, real GDP in the Riverside MSA grew faster by 5.1 percent compared with 2.8 percent nationally and 3.2 percent in California. During the Great Recession, however, the Riverside MSA suffered more substantial losses, with its real GDP falling by 5.3 percent locally versus 2.6 percent nationally and 3.2 percent in California. The Riverside MSA was also slower to recover, taking approximately four years to reach pre-recession GDP in 2013, while the nation and California took only one and two years, respectively.

During the COVID-19 pandemic, the pattern was different. In 2020, the decline in real GDP in the Riverside MSA was just 1.5 percent, compared with 2.8 percent nationally and 3.2 percent in California. Moreover, recovery was faster across all three geographic levels: The United States, California, and the Riverside MSA all returned to pre-pandemic real GDP levels within two years and have continued to grow.

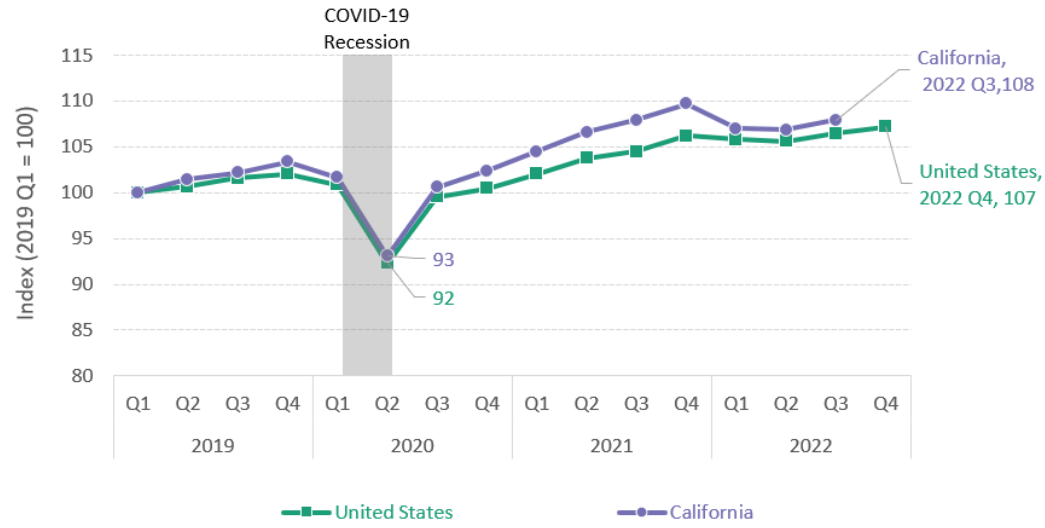
Figure A-12 Real GDP Index (2001=100), 2001-2021

Sources: *U.S. Bureau of Economic Analysis and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Figure A-13 provides more insight into GDP recovery at the state and national levels (quarterly data at the MSA level are not yet available). California had fully recovered to 2019 real GDP levels by the third quarter of 2020, and the nation had fully recovered by the fourth quarter of 2020. By the third quarter of 2022, California's real GDP stood 8 percent above the January 2019 level, and the real GDP in the United States was 7 percent higher. Given the annual GDP recovery and the quarterly trends, the prospects for continued economic recovery appear favorable for the Riverside MSA.

Figure A-13 Real GDP Recovery from the COVID-19 Recession (Index, Q1 2019=100), Q1 2019 - Q4 2022



Sources: *U.S. Bureau of Economic Analysis and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Labor Market

Labor market trends evolve with business cycles and reflect the state of the economy. They correlate positively with income and travel patterns. Business creation, employment growth, and low unemployment stimulate leisure and business travel.

Business Establishments

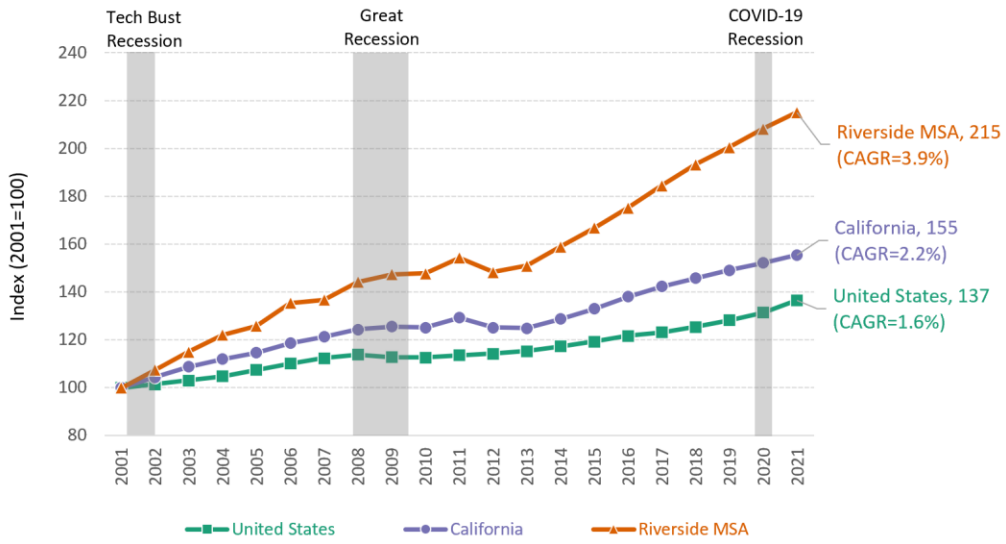
A growing number of business establishments indicate a healthy business climate, a high level of entrepreneurism, and a favorable startup environment. New business formation creates jobs and promotes overall economic growth.

The entrepreneurial spirit is vibrant in the Riverside MSA. Between 2001 and 2021, the number of business establishments in the Riverside MSA grew by 216 percent (3.9 percent CAGR). California saw a 55 percent increase overall (2.2 percent CAGR), and the nation grew by 37 percent (1.6 percent CAGR). All regions experienced slowing business formation during the Great Recession, but the pace picked up after 2013. Between 2013 and 2021, business establishment growth proceeded at a rapid 4.5 percent in the Riverside MSA compared with just 2.8 percent in California and 2.1 percent nationally. There was no slowdown in business creation during the COVID-19 pandemic as there was during the Great Recession.

The City of Palm Springs supports new business development by providing support via their "Opening a Business" website.[19] The Palm Springs Chamber of Commerce also provides resources for potential business startups.[20] Continued business creation will benefit the Riverside MSA, as new organizations foster innovation, job creation, and create spillover effects to other businesses and industries.[21] **Figure A-14** shows the business establishment index.

[19] City of Palm Springs, Opening a Business, https://www.palmspringsca.gov/government/departments/community-economic-development-department/economic-development/opening-a-business.
[20] Palm Springs Chamber of Commerce, Business Startup: The First Step, https://pschamber.org/business-startup-the-first-step/.
[21] U. Akcigit and W. Kerr, 2010, "Growth through heterogeneous innovations," National Bureau of Economic Research, *Working Paper* 16443.

Figure A-14 Business Establishment Index (2001=100), 2001-2021



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

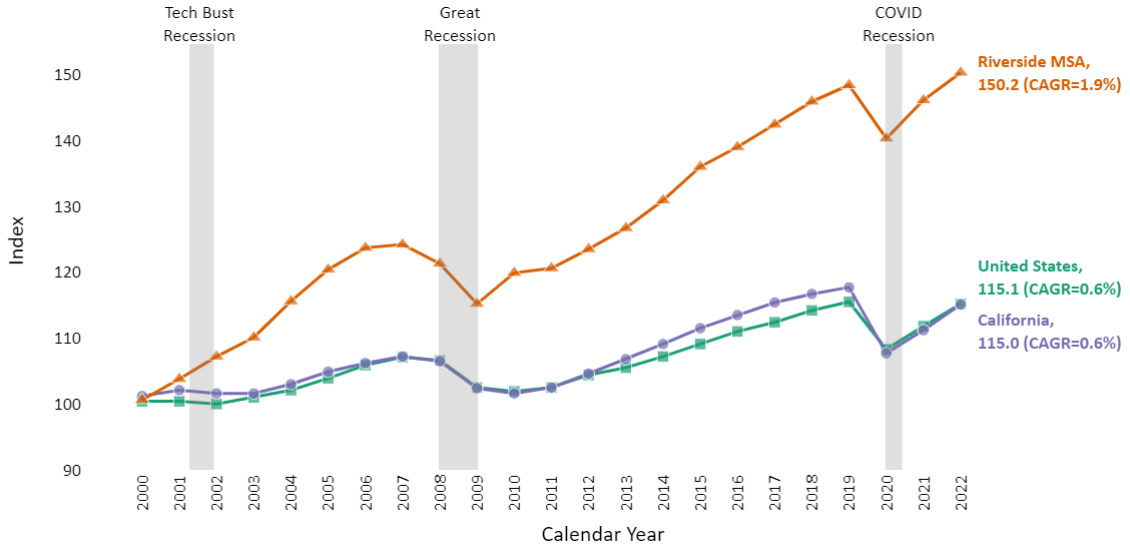
Employment

From 2000 to 2022, nonfarm employment levels in the Riverside MSA increased by 50 percent overall, at a 1.9 percent CAGR. This is much faster than state and national growth of 10 percent (0.6 percent CAGR) during the same period, which is shown in **Figure A-15**.

Throughout the United States, employment decreased during the Great Recession of 2008-2009. It recovered quickly in the Riverside MSA but more gradually in the state and nation during the economic expansion through 2019. Between 2012 and 2019, employment grew by a total of 20 percent (2.7 percent CAGR) in the Riverside MSA but only 13 percent (1.7 percent CAGR) in California and 11 percent (1.4 percent CAGR) in the nation. In 2020 when the U.S. economy entered another recession induced by the COVID-19 pandemic, employment again decreased by about 5 percent in the Riverside MSA, 8 percent in California, and 6 percent nationally.

During the pandemic, employment, measured monthly, decreased more sharply—by 15 percent in the Riverside MSA and 16 percent in the United States and California from January to April 2020, as shown in **Figure A-16**. However, recovery in the Riverside MSA has been swift. By February 2023, the Riverside MSA had exceeded its January 2020 pre-pandemic employment level by 3 percent, outperforming the United States with 101 percent of pre-pandemic employment and California with 98.6 percent. This strong employment resilience in the MSA bodes well for long-term economic health.

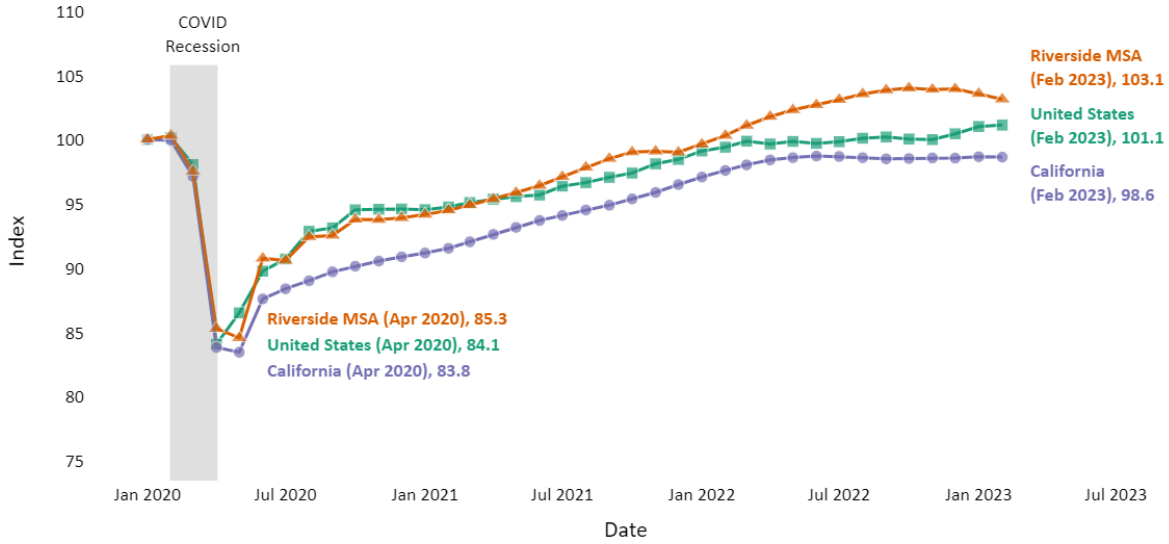
Figure A-15 Employment Index (2000=100), 2000-2022



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Figure A-16 Employment Recovery from the COVID-19 Recession (Index, January 2020=100), January 2020 - February 2023



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

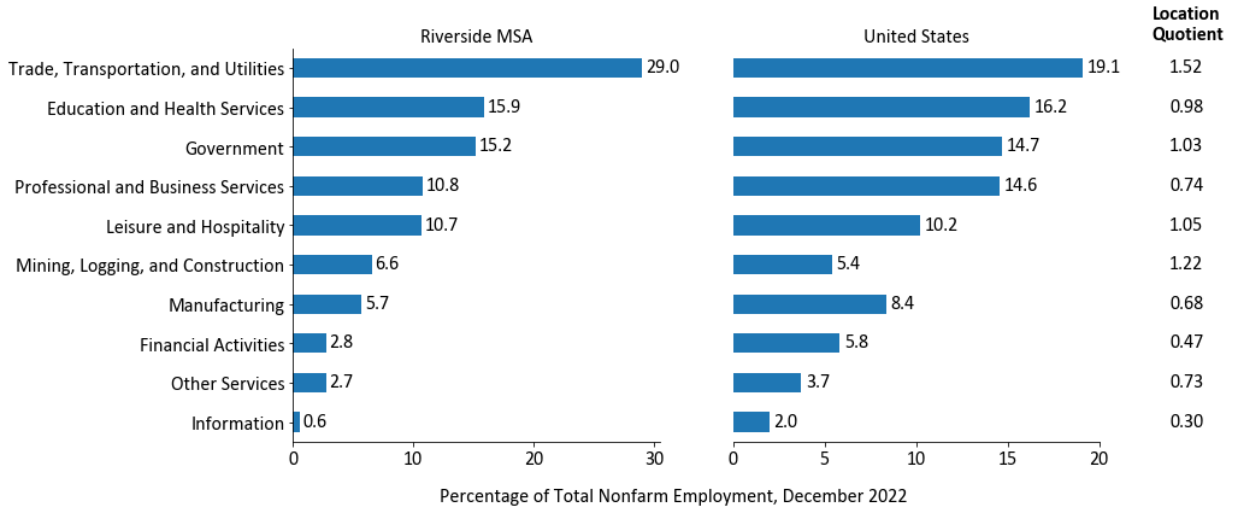
Nonfarm Employment by Industry

A diversified economy withstands shocks better. On the other hand, heavy specialization, especially in pro-cyclical industries such as construction, mining, and manufacturing, exposes the local economy to more significant business cycle fluctuations. Since regions tend to specialize in certain economic activities

owing to natural resources, geographic attributes, labor supply, business climate, and other factors, they also tend to be more concentrated in specific industries than the national economy.

Figure A-17 shows the percentage distribution of employment by nonfarm industry sectors in the Riverside MSA and the United States in December 2022. It also shows the location quotient (LQ), which indicates how much more the Riverside MSA specializes in a particular industry than the nation. LQ represents the ratio of an industry's share of the MSA's nonfarm employment to its share of total U.S. nonfarm employment. An LQ above one indicates that the industry contributes a more significant percentage of jobs in the MSA, indicating specialization. Conversely, an LQ below one indicates that the industry has a smaller share of regional employment.

Figure A-17 Percent Employment and Location Quotients – Selected Nonfarm Sectors, December 2022



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

In the Riverside MSA, the largest industry sector with 29 percent of employment is trade, transportation, and utilities, including activities such as retail and wholesale. The second and third largest industry sectors are education and health services, with 15.9 percent of employment, and government, with 15.2 percent. These are also the top three sectors by the number of workers nationally.

In the distribution of employment by industry, the Riverside MSA economy largely mirrors the U.S. economy. The Riverside MSA LQs, however, show greater specialization in four industry sectors:

- Trade, transportation, and utilities Education and health services with an LQ of 1.52
- Mining, logging, and construction with an LQ of 1.22
- Leisure and hospitality with an LQ of 1.05
- Government with an LQ of 1.03.

Meanwhile, the Riverside MSA shows smaller employment shares and low LQs of just 0.30 for the information sector, 0.47 for the financial activities sector, 0.68 for the manufacturing sector, and 0.74 for the professional and business services sector. These industries have a smaller presence in the MSA than in the nation.

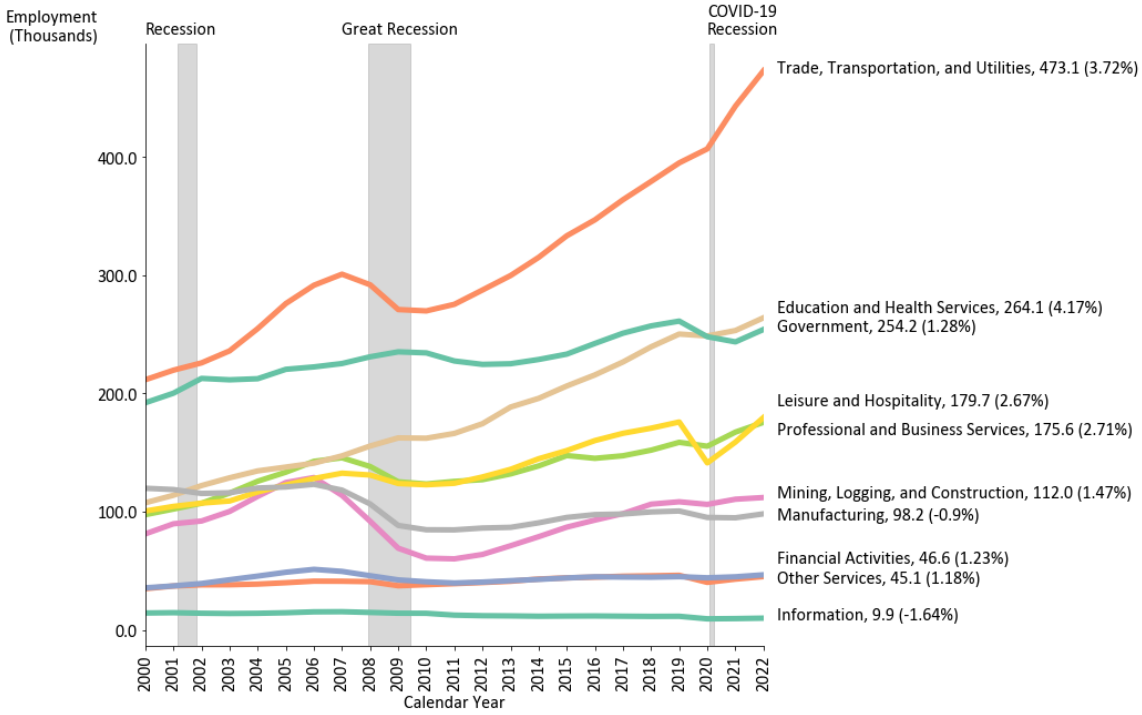
Figure A-18 shows annual trends in employment in selected nonfarm sectors from 2000 through 2022. The effects of the Great Recession (2008-2009) and the COVID-19 recession (2020) are evident, especially in pro-cyclical sectors such as construction; manufacturing; leisure and hospitality; trade, transportation, and utilities; and professional and business services. These industries suffered declines in employment in the last two recessions.

In contrast, trade, transportation, and utilities—the largest sector in the Riverside MSA and the nation—saw large employment gains averaging 3.7 percent annually. Growth in this sector was driven by employment gains in warehousing and storage, truck transportation, and food service, among others. Education and health services, leisure and hospitality, and professional and business services also posted high annual growth rates of 4.2, 2.7, and 2.7 percent, respectively. Information (-1.64 percent CAGR) and manufacturing (-0.9 percent CAGR) were the slowest-growing sectors.

Leisure and tourism, a critical sector for the greater Palm Springs region, suffered significant employment losses during the COVID-19 pandemic after enjoying steady growth between 2011 and 2019. This trend was widespread, as stay-at-home orders and public reluctance to travel disproportionately impacted leisure and tourism. In 2020, the Riverside MSA lost almost 20 percent of its leisure and hospitality jobs, although recovery has been strong. As of 2022, the sector had 2.2 percent more jobs than in 2019.

Financial activities, mining, logging and construction, professional and business services, education and health services, and trade, transportation and utilities are other sectors that recovered and exceeded 2019 employment by 2022. However, information, other services, manufacturing, and government remain below 2019 employment levels.

Figure A-18 Employment by Selected Industry, 2000-2022

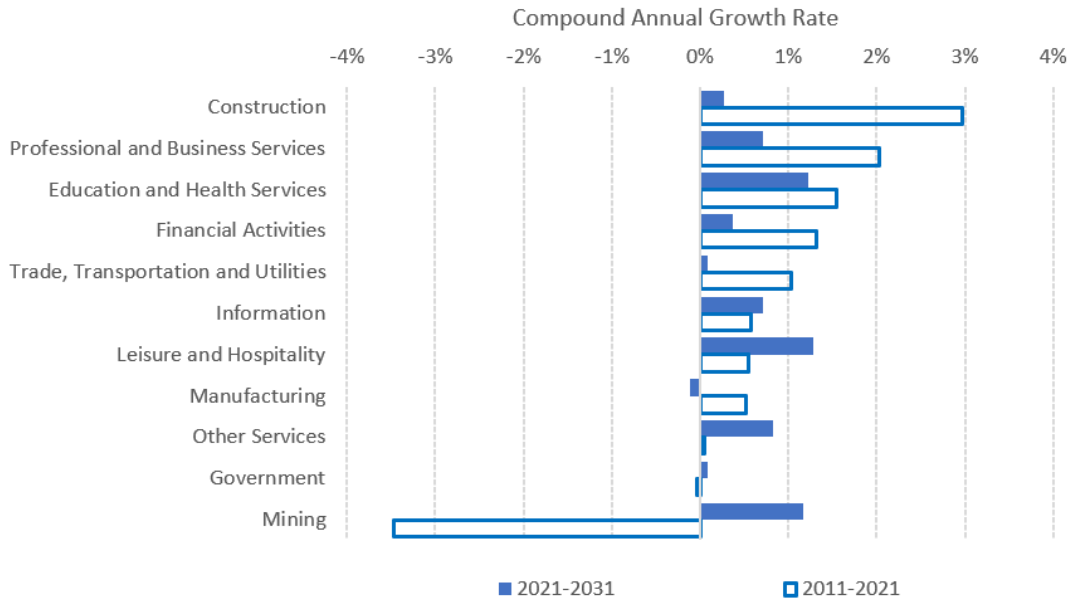


Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Looking to the future, the Riverside MSA is poised to continue strong employment growth. **Figure A-19** shows historical employment growth by sector from 2011-2021 and forecast growth from 2021-2031. Two industries with a relatively large presence in the Riverside MSA—trade transportation and utilities and leisure and hospitality—are forecast to grow strongly in the coming decades.

Figure A-19 Historical and Forecast Growth Rates by Industry Sector, 2011-2021 and 2021-2031



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Leading Employers

The Riverside MSA has a range of large public and private employers who, along with the many small enterprises in the area, form the backbone of the region's economy. Strong corporate presence generates business demand for air travel. **Table A-3** lists selected employers in the Riverside MSA.

The region has major employers like Amazon, Kaiser Permanente, Stater Brothers, FedEx, and various health, logistics, and leisure-focused businesses apart from the government. Diversity in the job market provides wide-ranging employment opportunities for residents and protects the region from sector-specific downturns. Encouraging business growth that capitalizes on the strengths of the Palm Springs (and the Riverside MSA) labor market and geography while encouraging diversification strengthens the region's economy.

Table A-3 Selected Employers in the Riverside MSA

Organization	Estimated Employment Range	Industry
Local Government	>10,000	Government
State Government	>10,000	Government
Federal Government	>10,000	Government
Amazon	>10,000	E-Commerce
Kaiser Permanente Riverside Medical Center	5,000-9,999	Health
March Air Reserve Base	5,000-9,999	Military
Ontario International Airport	5,000-9,999	Transportation
Pechanga Resort & Casino	5,000-9,999	Resort Casino
Stater Bros	5,000-9,999	Retail
University of California, Riverside	5,000-9,999	Education
Walmart	5,000-9,999	Retail
Abbott Vascular Inc	1,000-4,999	Logisitcs
Agua Caliente Band of Cahuilla Indians	1,000-4,999	Tribal Government/Resort Casino
Arrowhead Regional Medical Ctr	1,000-4,999	Health
Big Bear Mountain Resorts	1,000-4,999	Resorts
Burlington Distribution Ctr	1,000-4,999	Logistics
Collins Aerospace	1,000-4,999	Manufacturing
Eisenhower Medical Center	1,000-4,999	Health
Environmental Systems Research	1,000-4,999	Software Services
Fedex Ground	1,000-4,999	Delivery Service
JW Marriott Desert Springs Resort & Spa	1,000-4,999	Resorts
Mountain High Ski Resort	1,000-4,999	Resorts
Starcrest Products	1,000-4,999	E-Commerce
Sun World Intl LLC	1,000-4,999	Wholesale Agriculture
YRC Freight	1,000-4,999	Logistics

Sources: *Riverside County Economic Development Agency, U.S. Bureau of Labor Statistics, State of California Employment Development Department, and Unison Consulting, Inc.*

Notes: *The list is not exhaustive. Data are from various years, 2019-2022.*

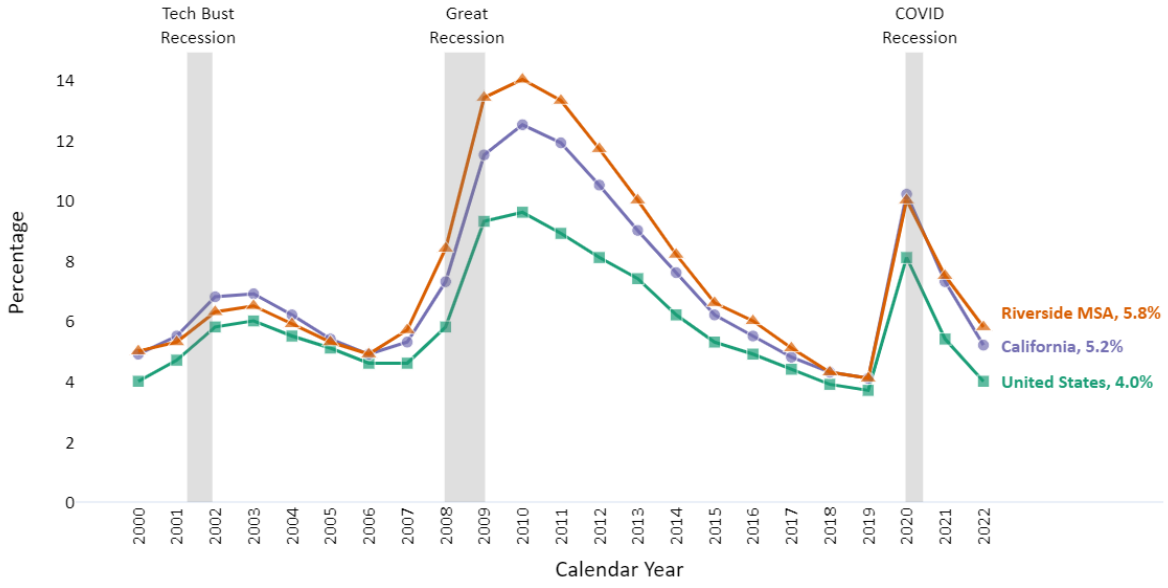
Unemployment

The unemployment rate represents the share of unemployed members of the labor force (those 16 years and older who are either employed or unemployed and actively looking for work). It provides a measure of unmet demand for jobs. High levels of unemployment imply lower incomes and less discretionary income for travel. As with employment, the unemployment rate follows business cycles. **Figure A-20** shows the annual unemployment rate.

Unemployment rose during the Great Recession to 14 percent in the Riverside MSA, 12.5 percent in California, and 9.6 percent nationally. It declined during the subsequent expansion to rates signifying full employment: 4.1 percent in the Riverside MSA and California and 3.7 nationally in 2019.[22]

In 2020, amid the business lockdowns during the COVID-19 pandemic, unemployment spiked to an annual average of 8.1 percent in the United States, 10.3 percent in California, and 10 percent in the Riverside MSA. By 2022, the annual average unemployment rate decreased to 4.0 percent nationally but remained high in California (5.2 percent) and the Riverside MSA (5.8 percent). Monthly data in **Figure A-21** paint a brighter picture: Unemployment rates have consistently dropped since 2020 and, in February 2023, reached 4.1 percent in the Riverside MSA, 4.3 percent in California, and 3.6 percent nationally—approaching historic-low January 2020 levels. A decline in labor force participation contributes to the low unemployment rates. Nevertheless, the MSA's strong employment recovery and return to low unemployment rates attest to economic resilience.

Figure A-20 Annual Unemployment Rate, 2000-2022

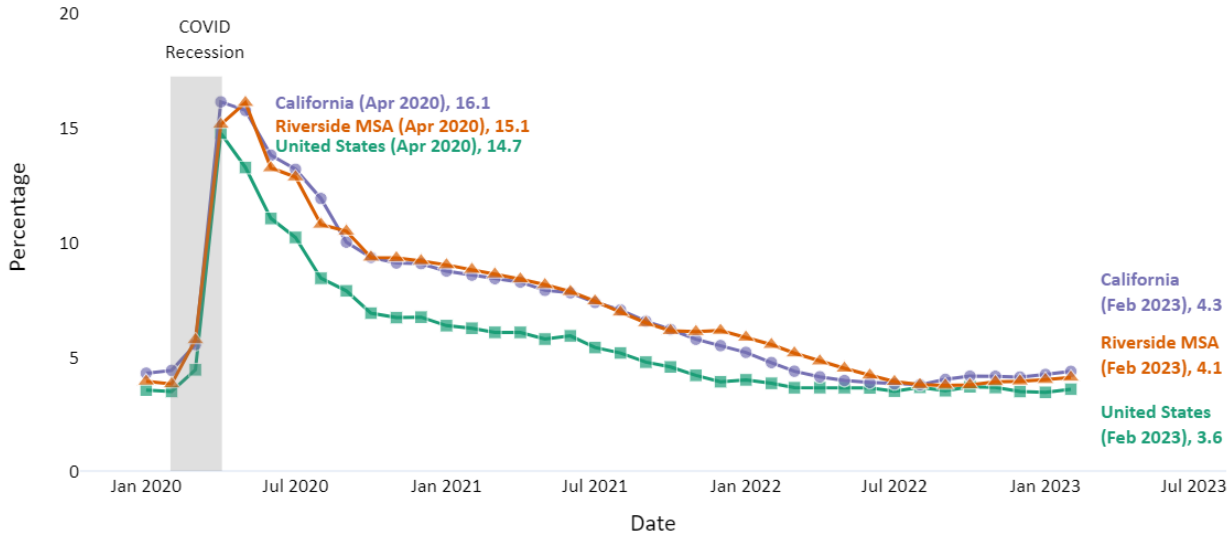


Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

[22] Unemployment rates between 4.1 and 4.7 percent imply full employment—a state where "…the unemployment rate equals the nonaccelerating inflation rate of unemployment, no cyclical unemployment exists, and GDP is at its potential." Sources: (1) C. Cook, "Full Employment," Bloomberg, 2016. (2) Bureau of Labor Statistics, "Full Employment: an assumption within BLS projections," 2017.

Figure A-21 Monthly Unemployment Rate, January 2020-February 2023

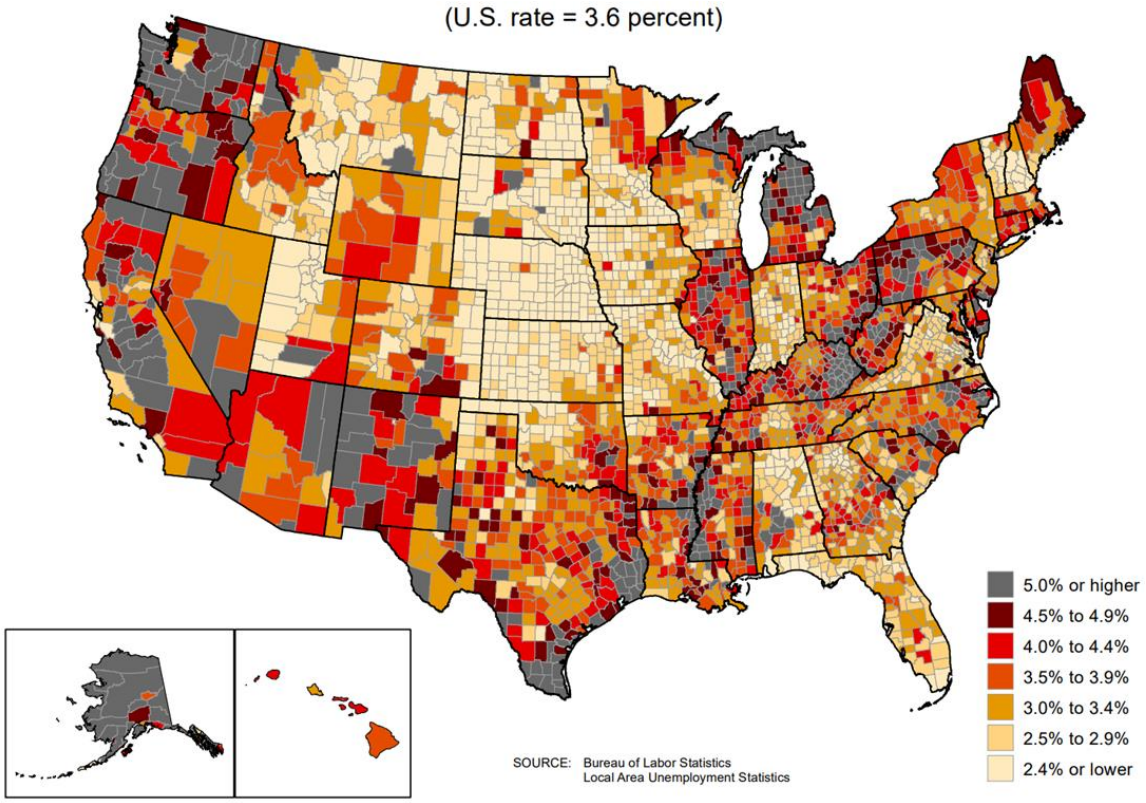


Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Figure A-22 shows the 12-month average unemployment rate through February 2023 by county in the United States. Unemployment rates in the MSA's Riverside and San Bernardino counties are lower than in many other California counties but slightly higher than the national average.

Figure A-22 Unemployment Rate by County, 12-Month Average through February 2023



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Commuting

In 2019, of the 1.15 million people employed in the MSA, nearly 70 percent also lived in the MSA. The remaining 30 percent of workers come from Los Angeles, Orange, and San Diego Counties. Overall, the county has a net outflow of jobs. On average, approximately 256,000 more workers leave the county for work than commute into the Riverside MSA. The primary destinations are again Los Angeles, Orange, and San Diego Counties. In sum, while the MSA is a major employment node, its proximity to other large metropolitan regions also provides residents with employment options.

Tourism

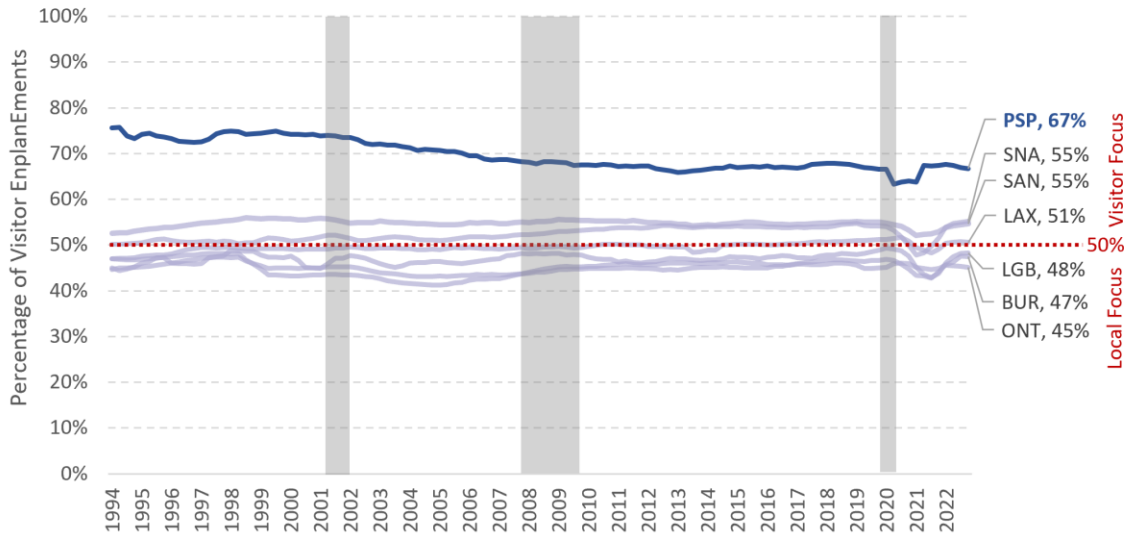
Tourism is a significant component of the economies of California, the Riverside MSA, and the Palm Springs area. It is a "basic" economic activity and a key driver of economic growth. It brings "new money" from visitor spending on food, lodging, recreation, and other services provided by local businesses.[23] In 2021, travel-related spending in California exceeded 100 billion dollars, contributed nearly 10 billion dollars in tax revenue, and supported almost 1 million jobs. In the Riverside MSA, tourism-related

[23] In regional economics, "basic" industries, also known as export-base industries, refer to sectors of the economy that generate revenue from customers from outside the region, thus bringing "new money" into the region.

spending amounted to nearly 14 billion dollars in 2021, contributing over 1 billion dollars in tax revenue and supporting more than 130,000 jobs. PSP is a gateway to Joshua Tree National Park, more than 100 golf courses,[24] resorts, vacation activity, and seasonal housing. Numerous events, including the Coachella Valley Music and Arts Festival, Palm Springs Film Festival, BNP Paribas Open tennis tournament, and the Coachella Valley Wildflower Festival, draw visitors to the region.[25, 26] PSP is a central node for the arrival of non-local tourist visitors.

The Airport's fundamental role in bringing visitors to the region is evident in **Figure A-23**. PSP shows the largest visitor share of O&D enplanements among Southern California commercial service airports. Although the share has declined over the long term—from around 75 percent in the 1990s, it is still substantial at 67 percent in 2022. At the other Southern California airports, the visitor share ranges from about 45 percent to 55 percent.

Figure A-23 Visitor Share of O&D Enplanements at Each Southern California Airport (4-Quarter Moving Average), 1993-2022



Sources: *U.S. Department of Transportation and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

The greater Palm Springs region draws visitors from across the country. Visitors from California, Oregon, and Washington contribute the most in spending. However, visitors from states further to the east—

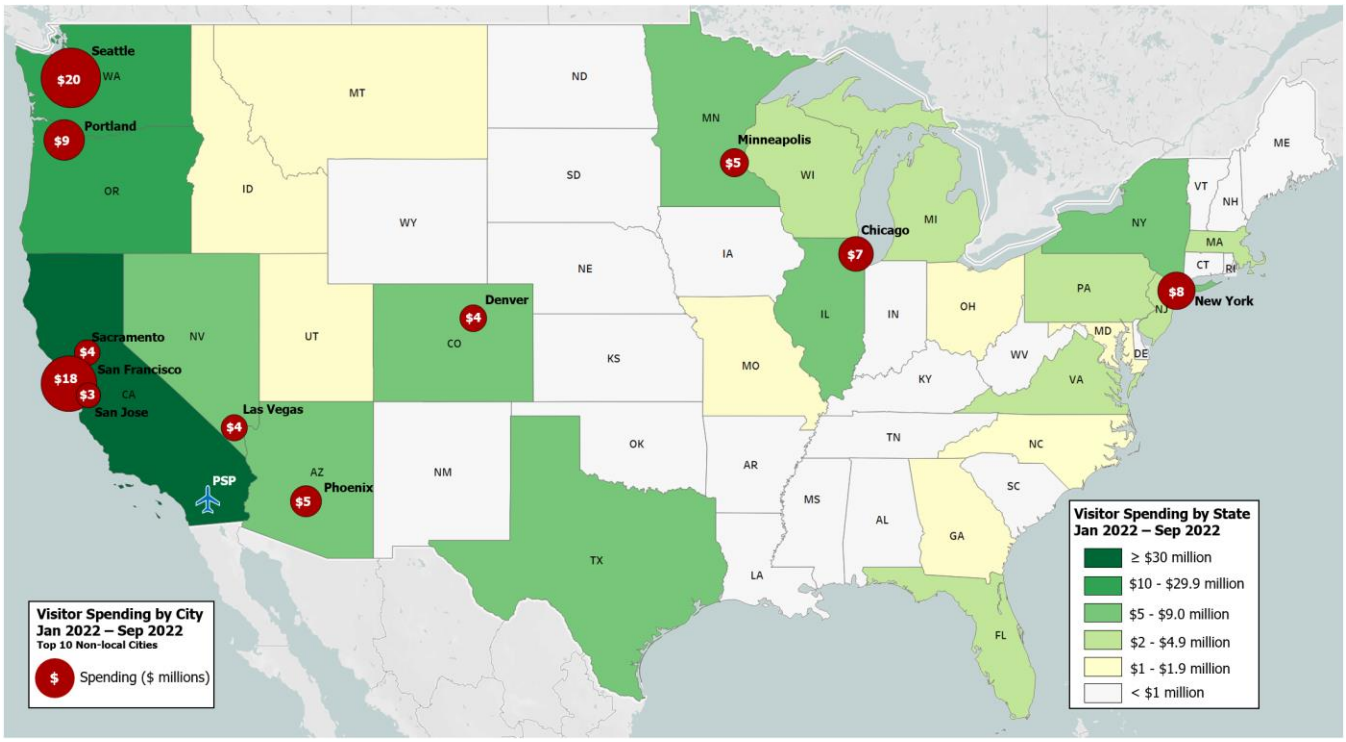
[24] Visit Greater Palm Springs, https://www.visitgreaterpalmsprings.com/things-to-do/.

[25] California Lifestyle Reality, "Top 4 Events to Attend in Coachella Valley, CA," https://californialifestylerealty.com/blog/top-4-events-attend-coachella-valley-ca/.

[26] Friends of the Desert Mountains, "The Coachella Valley Wildflower Festival," https://www.desertmountains.org/calendar/2023wildflower-festival.

Minnesota, Illinois, and New York—also figure prominently. By city, California Bay Area cities, Portland, Seattle, Chicago, and New York are among the top sources of visitor spending in Palm Springs, as shown in **Figure A-24**.

Figure A-24 Visitor Spending in Greater Palm Springs Region by State of Origin and Top Non-Local Cities, Jan 2022-Sep 2022[27]



Sources: *Visit Greater Palm Springs and Unison Consulting, Inc.*

Historically, Canada has been an important source of international visitors. **Table A-4** shows nonstop scheduled seats Canadian cities from 2018-2022. During the 2019 peak, there were more than 277,000 seats on nonstop flights from Canada, primarily from Calgary and Vancouver but also from Edmonton, Toronto, and Winnipeg. Complexities of cross-border transits during the COVID-19 pandemic impacted international tourism more severely than domestic tourism. In 2022, airline seat capacity from Canadian cities had rebounded somewhat but remained, on average, 25 percent below pre-COVID-19 numbers. The return of Canadian visitors will be important to the region. A 2017 study indicated that Canadian visitor spending exceeded 235 million dollars and was significantly more than the spending per visitor coming from other regions.[28]

[27] For this analysis, Visit Greater Palm Springs typically defines the Palm Springs region as: Palm Springs, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, and Rancho Mirage.

[28] S. Barkas, "Canadians have 300 million dollars plus impact on the Coachella Valley economy," *Desert Sun*, October 9, 2018.

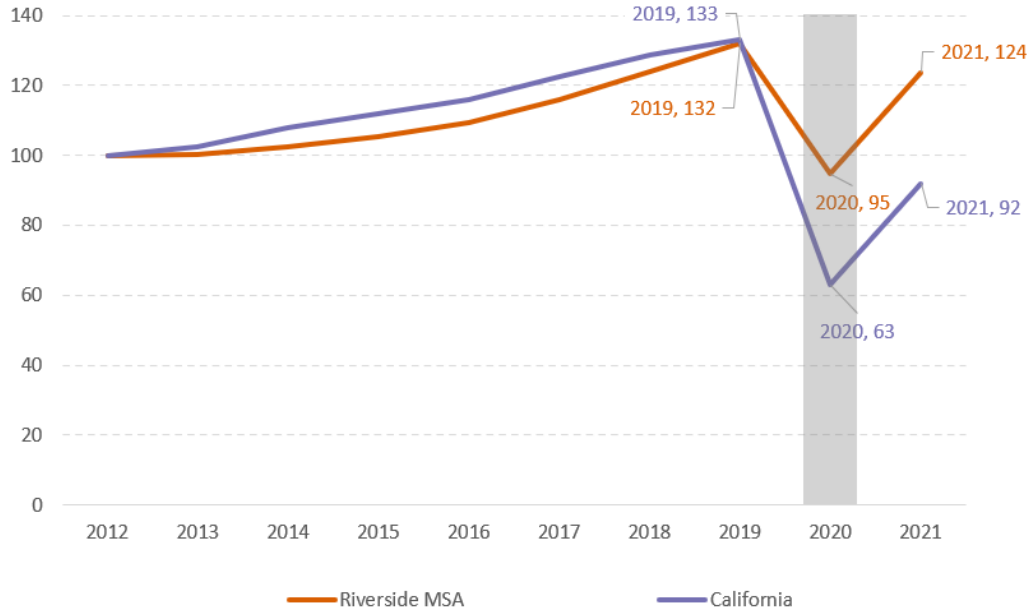
Table A-4 Nonstop Air Service Seat Capacity from Canada, 2018-2022

Code	City	2018	2019	2020	2021	2022	2022 vs. 2019
YVR	Vancouver	99,275	108,536	42,158	25,034	88,103	81%
YYC	Calgary	111,282	116,463	44,612	34,716	69,348	60%
YEG	Edmonton	31,271	35,154	13,344	7,794	28,068	80%
YYZ	Toronto	16,867	10,404	10,608	756	18,274	176%
YWG	Winnipeg	9,731	6,504	3,781	1,140	5,340	82%
Total		**268,426**	**277,061**	**114,503**	**69,440**	**209,133**	**75%**

Sources: *OAG and Unison Consulting Inc.*

Figure A-25 shows visitor spending in California and the Riverside MSA from 2012 to 2021. Between 2012 and 2019, overall growth in visitor spending in California and the Riverside MSA mirrored each other, increasing by about one-third overall and at a CAGR of about 4.1 percent. As expected, visitor spending fell in both California and the MSA during the COVID-19 pandemic. However, while visitor spending dropped by 53 percent statewide, it dropped by just 28 percent in the Riverside MSA. By the end of 2021, visitor spending in California remained at just 69 percent of the pre-COVID-19 level, while it had recovered to 94 percent in the Riverside MSA and is on an upward trajectory.

Figure A-25 Visitor Spending Index (2012=100), Riverside MSA and California, 2012-2021



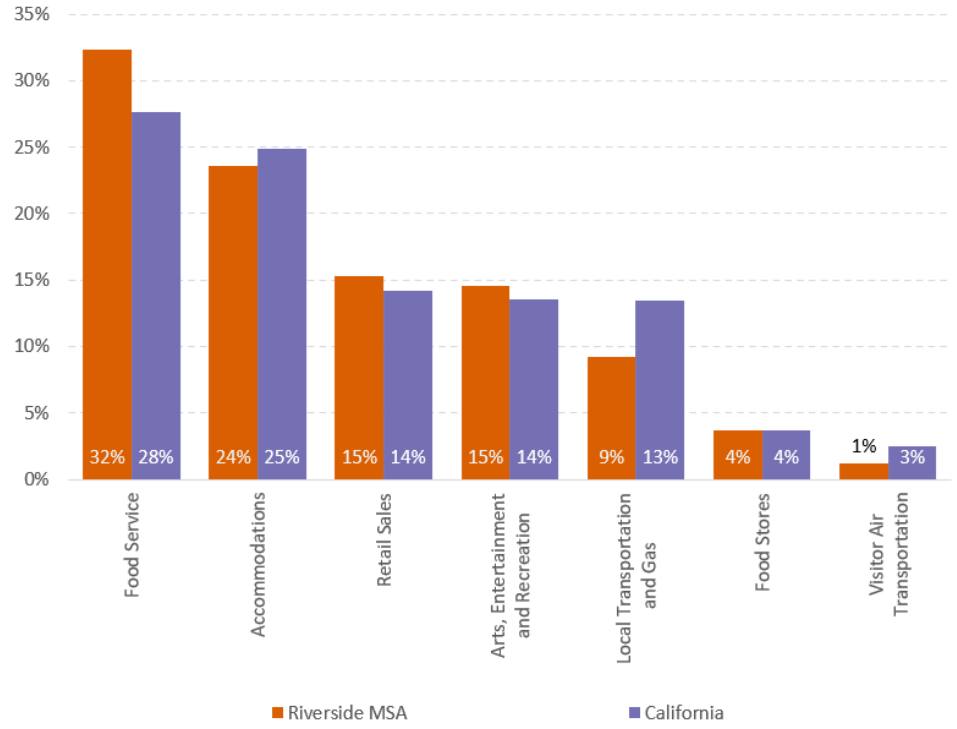
Sources: *Visit California and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Visitors spend the most on food service (32 percent), followed by accommodation (24 percent) and retail (15 percent). **Figure A-26** provides a breakdown of visitor spending by category. The spending patterns in the Riverside MSA are similar to those in the state. **Figure A-27** shows the distribution of accommodation and food service sales by census tract in the Riverside MSA, using location quotients to measure relative

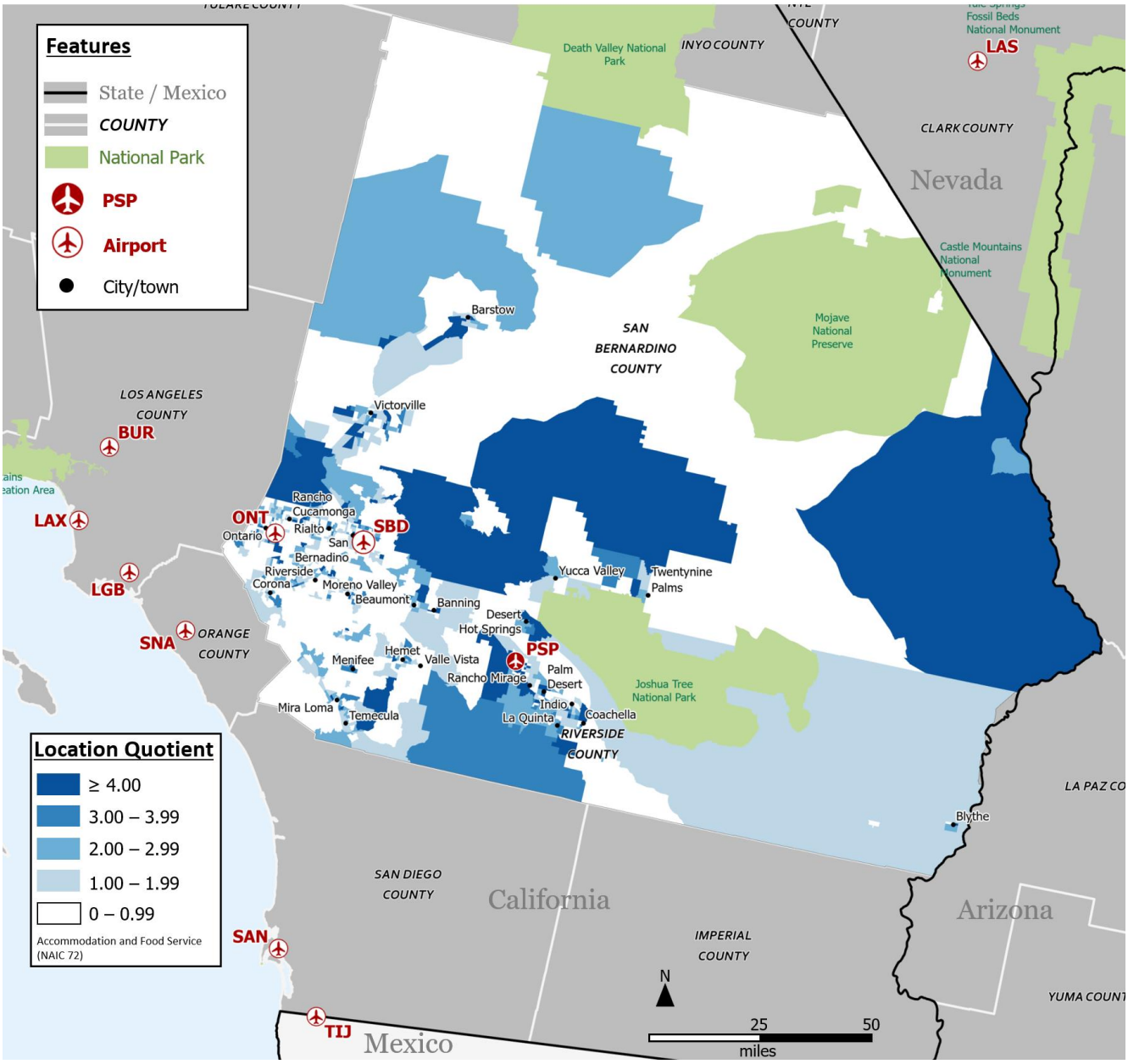
spatial concentration. A significant portion of the MSA has an LQ greater than 1, and the areas immediately surrounding PSP have LQs greater than 2, 3, or even 4—indicating that the accommodation and food service industry is more concentrated in the region than in a typical local economy. Similar patterns also exist to the northeast near Twentynine Palms. This further solidifies the connections between the visitor orientation of the region, the industries that support visitors, and the airport's geographic location.

Figure A-26 Visitor Spending Index by Category, Riverside MSA and California, 2021



Sources: *Visit California and Unison Consulting, Inc.*

Figure A-27 Spatial Concentration of Accommodation and Food Services, Location Quotient, 2022

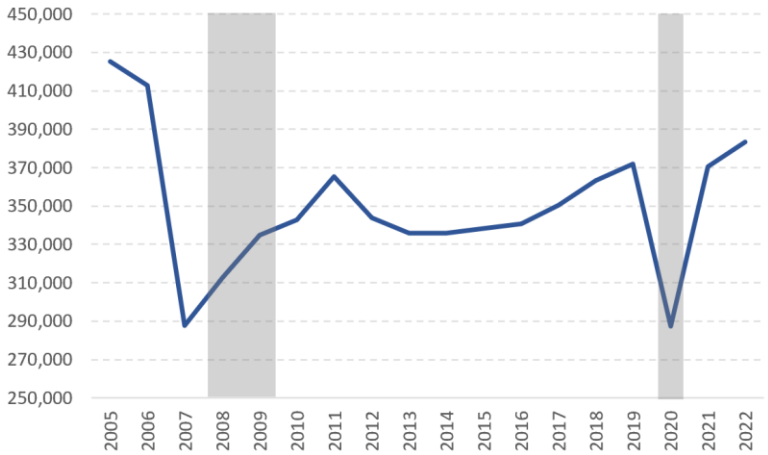


Sources: *Data Axle and Unison Consulting Inc.*

Note: *Location quotients are mapped by census tract.*

The supply of hotel rooms, measured in room nights, in Greater Palm Springs reached a 15-year high in 2022 since the steep drop in 2007. Although it has not returned to the high 2005 level, supply rebounded strongly from the most recent decline in 2020 during the pandemic. **Figure A-28** shows the number of hotel room nights available in Greater Palm Springs.

Figure A-28 Greater Palm Springs Hotel Room Nights, 2005-2022

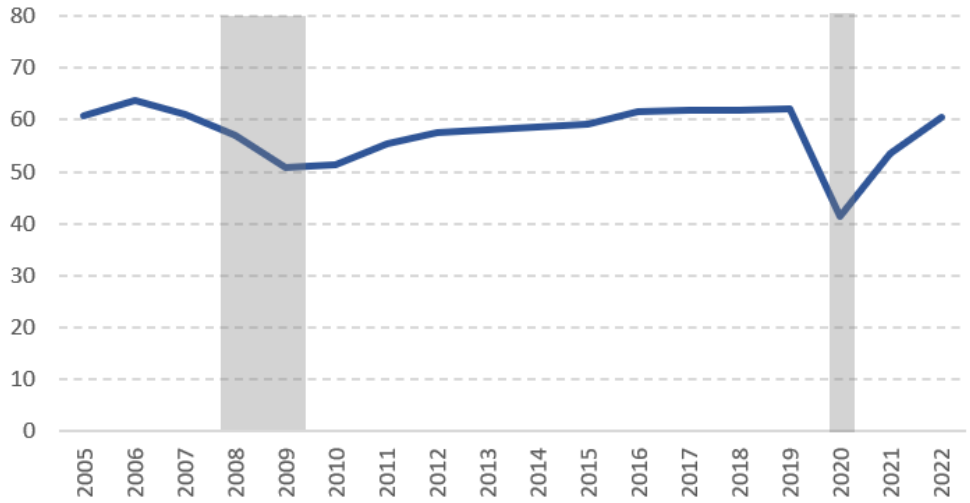


Sources: *Visit Greater Palm Springs and Unison Consulting, Inc.*

Notes: *Gray areas are economic recession periods. Room supply is based on sampling by Visit Greater Palm Springs.*

Figure A-29 shows that hotel occupancy in Greater Palm Springs stayed above 60 percent during the years before the pandemic. It dropped to 41 percent during the first year of the COVID-19 pandemic in 2020 but rebounded to 60.5 percent by 2022. The steady trend indicates that demand is keeping pace with supply growth.

Figure A-29 Greater Palm Springs Hotel Occupancy Rate, 2005-2022



Sources: *Visit Greater Palm Springs and Unison Consulting, Inc.*

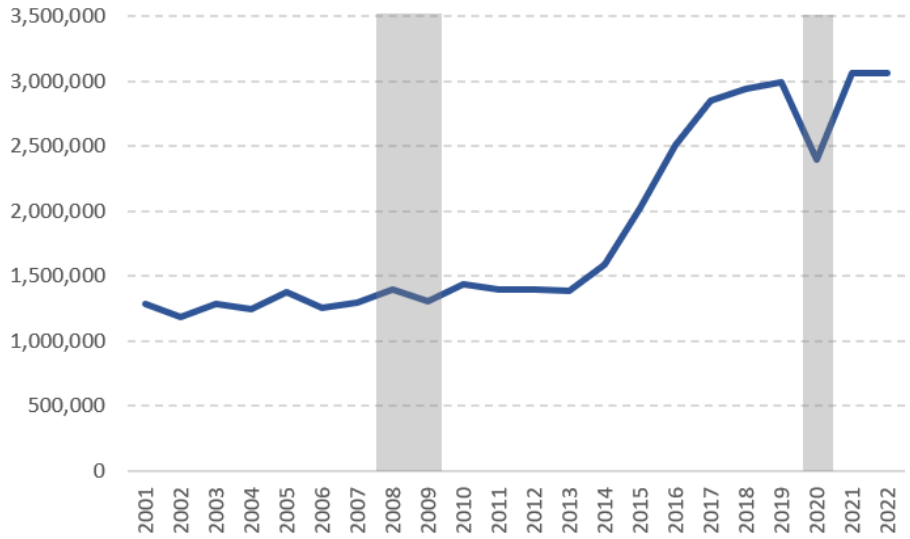
Notes: *Gray areas are economic recession periods. Occupancy rates by month are the 2005-2022 average.*

Hotels are just one type of available accommodation in Greater Palm Springs. In 2021, about 1.3 million visitors, comprising about 23 percent of overnight stays, stayed in short-term vacation rental housing,

spending 829 million dollars.[29] The larger Riverside MSA also has a relatively large proportion of homes for vacation or seasonal use: 5.9 percent compared to 3.4 percent of the housing stock nationally.[30]

Nearby Joshua Tree National Park is a major draw for visitors. The three major park entrances are not far from Palm Springs—one to the east along Interstate 10 and two northeast of PSP near Twentynine Palms. Between 2001 and 2022, park visitors increased from 1.3 million to about 3.1 million, at a rate of about 4.2 percent annually. Visitors increased sharply since 2013. **Figure A-30** shows the number of annual visitors to Joshua Tree National Park.

Figure A-30 Joshua Tree National Park Visitors, 2001-2022



Sources: *U.S. National Park Service and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Tourism continues to thrive in the Riverside MSA and Palm Springs region. Visitor spending, hotel occupancy, and leisure and hospitality employment have recovered from the pandemic. Canadian air service is returning, and Joshua Tree National Park visitation is close to an all-time high. The strong rebound, the robust seasonal home market, and the region's famous golf courses[31] ensure a positive outlook for Palm Springs tourism.

[29] Tourism Economics, The Economic Impact of Short-Term Vacation Rentals: Coachella Valley 2021.

[30] U.S. Census Bureau 2020 Redistricting Data.

[31] According to *Forbes*, there were more rounds of golf played in the United States in 2021 than in any other year. https://www.forbes.com/sites/erikmatuszewski/2022/02/27/golf-saw-record-play-totals-last-year-on-heels-of-covid-fueled-2020-boom/?sh=e1adeb24c31a

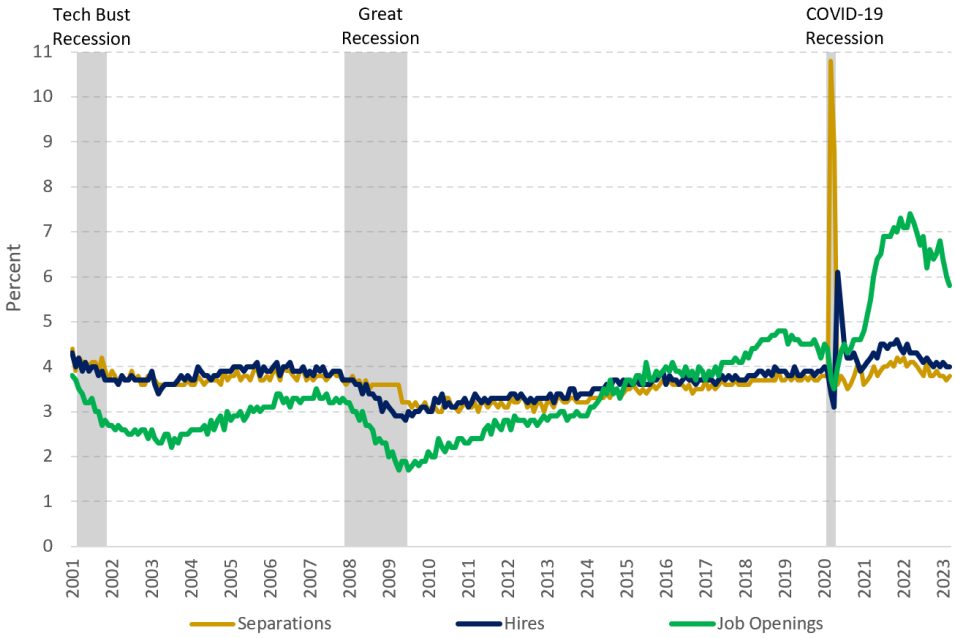
MACROECONOMIC INDICATORS

The broader U.S. economy affect regional economic conditions and overall demand for air transportation. The current trends in key macroeconomic indicators give mixed signals.

Employment

The labor market has been robust in the aftermath of the COVID-19 recession. However, **Figure A-31** shows that the Federal Reserve's recent efforts to slow inflation are cooling the labor market. In 2021 and early 2022, job openings rose rapidly while hires and separations remained relatively flat amid a shortage of workers to fill available positions. Data from late 2022 and early 2023 show that job openings are decreasing.

Figure A-31 Job Openings, Separations, and Hires, Monthly, January 2001- March 2023



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

Notes: *Gray areas are economic recession periods.*

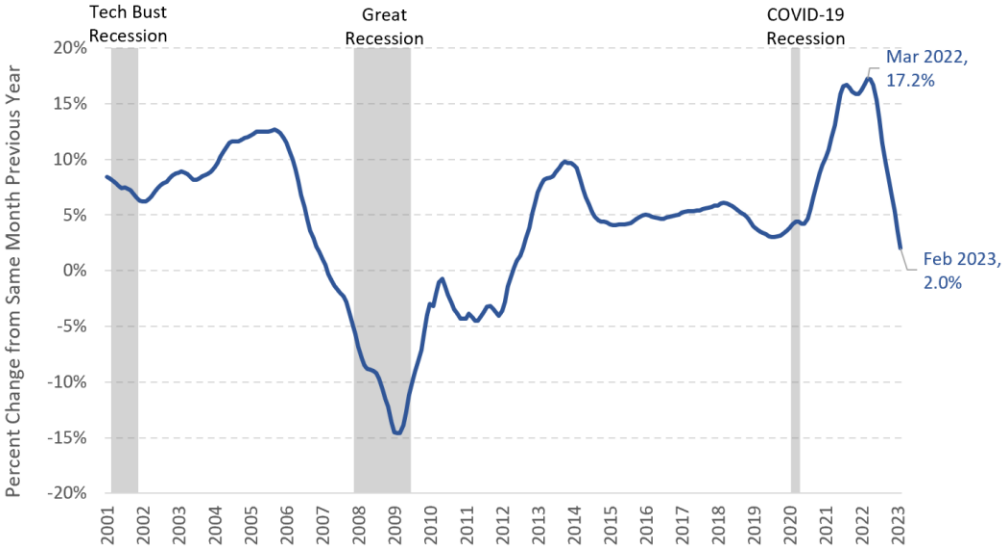
Separations and hires rates are a percentage of total employment. Job openings are a percentage of total employment plus openings.

Housing

A strong housing market signifies a thriving economy. It also stimulates consumer spending because, for many, housing comprises a substantial portion of net worth. **Figure A-32** shows that housing prices, which rose by 40 percent between January 2020 and March 2022, have retreated. High prices and high interest

rates have slowed demand. Moody's Analytics forecasts housing prices to fall 5-10 percent by early 2025.[32] Falling home prices will reduce consumer wealth, confidence, spending, and consumption.[33]

Figure A-32 S&P/Case-Shiller National Home Price Index, January 2001-Febuary 2023



Sources: *S&P Dow Jones and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

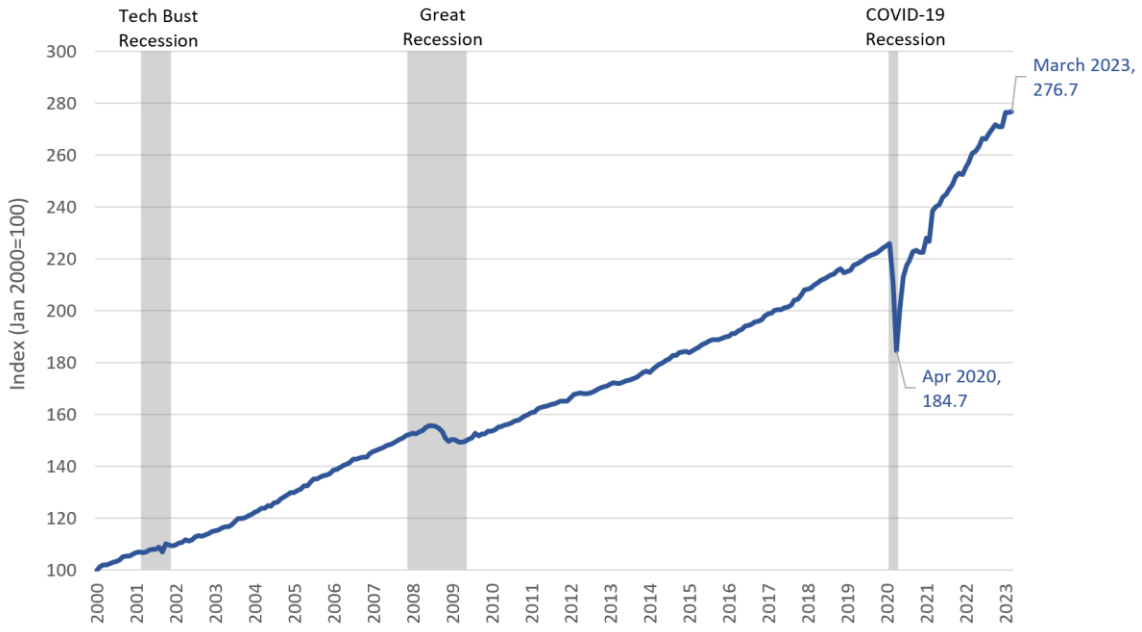
Consumer Spending

Consumer spending, a bellwether measure of the economy, continues to signal a growing economy. **Figure A-33** shows that personal consumption expenditures (PCE), which account for about 66 percent of the U.S. GDP, have continuously increased, apart from dips during the Great Recession and the COVID-19 pandemic. During the Great Recession, consumer spending decreased by 4.0 percent over eight months in late 2008 and early 2009, after which it rose by 50 percent (3.7 percent CAGR) from January 2009 to January 2020. At the onset of the COVID-19 pandemic, consumer spending decreased 18 percent over two months from February to April 2020 but rebounded quickly. It increased 50 percent through March 2023 to 22 percent above the pre-pandemic peak. Rising employee compensation has fueled recent increases in consumer spending.[34]

More broadly, consumer spending has been buoyed by high levels of excess savings and increases in household wealth from earlier gains in stock and housing prices during the pandemic. However, the effect of high inflation is starting to show as spending begins to outstrip incomes and consumers begin to draw down savings.

[32] V. Calanog and K. Fagan, "The Outlook for the Housing Market," Moody's Analytics, February 16, 2023.
[33] P.Carlsson-Szlezak and P. Swartz. "How much damage will the housing market do to the economy?," *Fortune*, August 9, 2022.
[34] U.S. Bureau of Economic Analysis, Personal Income and Outlays, February 2023.

Figure A-33 Personal Consumption Expenditures Index, January 2000-March 2023

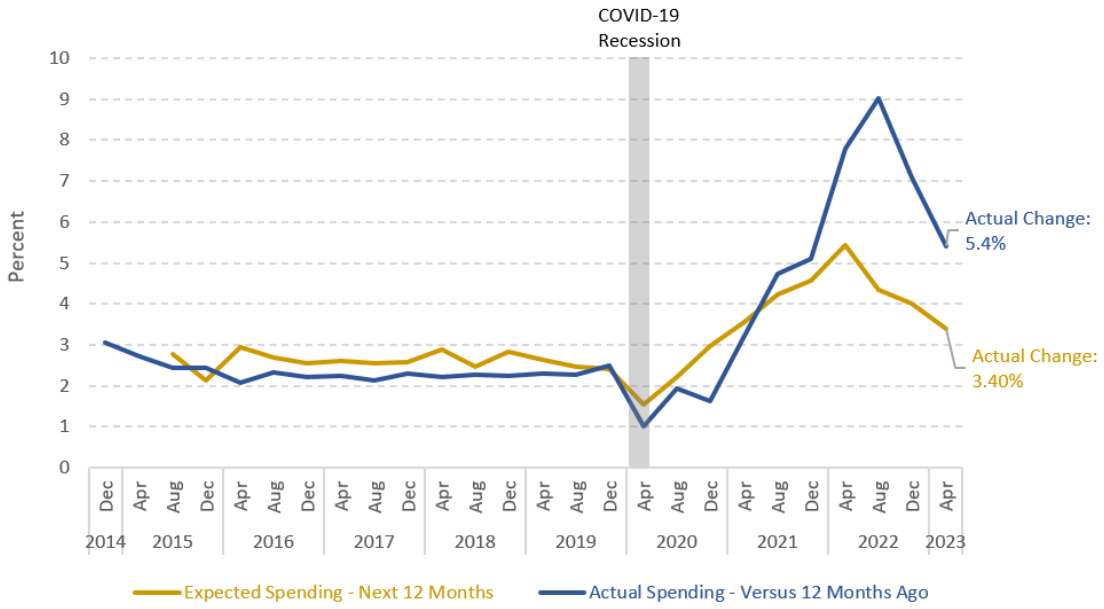


Sources: *U.S. Bureau of Economic Analysis; Unison Consulting, Inc.*

Note: *Gray area are economic recession periods.*

There are signs that the strong consumer spending that has supported the economic recovery since COVID-19 is beginning to weaken. **Figure A-34** shows consumer spending changes over the previous 12 months and expected spending levels over the upcoming 12 months. The two measures, which had largely mirrored each other until 2021, increased during late 2020 and 2021 due to the improved consumer outlook fostered by the supplementary income programs offered by the U.S. government during the pandemic. However, the two measures began to diverge in mid-2021, indicating that consumers expect their ability to sustain high spending to fall with the end of government income transfers and rising inflation.

Figure A-34 Actual and Expected Consumer Spending: 12-months ago, Next 12 Months, September 2014-April 2023

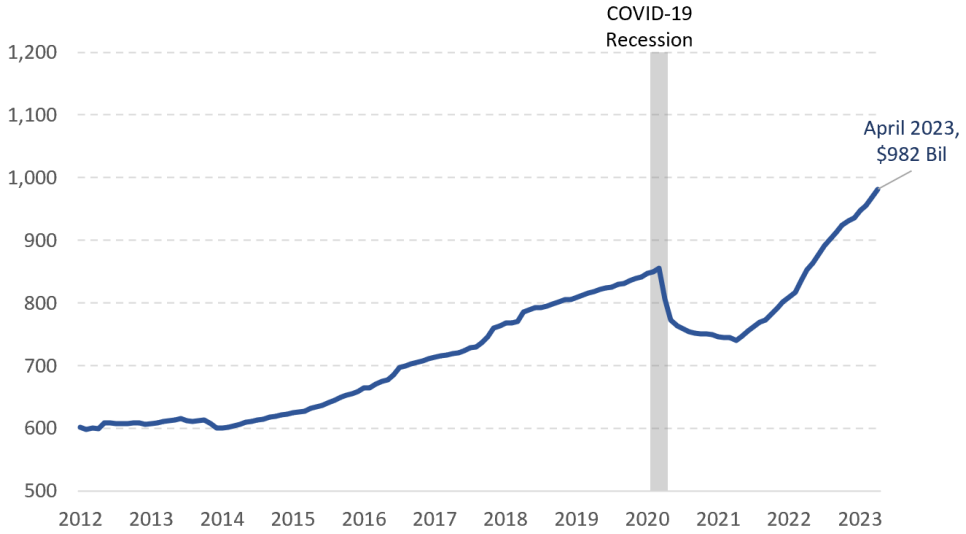


Sources: *Federal Reserve Bank of New York and Unison Consulting, Inc.*

Note: *Data represent consumers' experience and expectation at a given date (x-axis). The actual change is the experience over the past 12 months. The expectations are beliefs about what will happen over the next 12 months as of the date on the x-axis.*

Consumer spending has been partly fueled by borrowing, as indicated by the rapid rise in consumer loan balances, including credit card debt, as shown in **Figure A-35**. Between January 2012 and 2020, consumer loan balances increased by 42 percent, at a CAGR of 4.5 percent. Government stimulus programs for consumers reversed this trend, and between March 2020 and April 2021, consumer revolving loan balances decreased by 14 percent. From April 2021 to April 2023, consumer loan balances increased by 33 percent. The total amount owed by consumers is quickly approaching 1 trillion dollars. The current environment of high inflation and rising interest rates will impinge on the ability of consumers to manage heavy debt burdens and sustain high spending.

Figure A-35 Consumer Loans: Credit Cards and Other Revolving Plans (Commercial Banks), Billions of Dollars, January 2012-April 2023



Sources: *U.S. Board of Governors of the Federal Reserve System and Unison Consulting, Inc.*

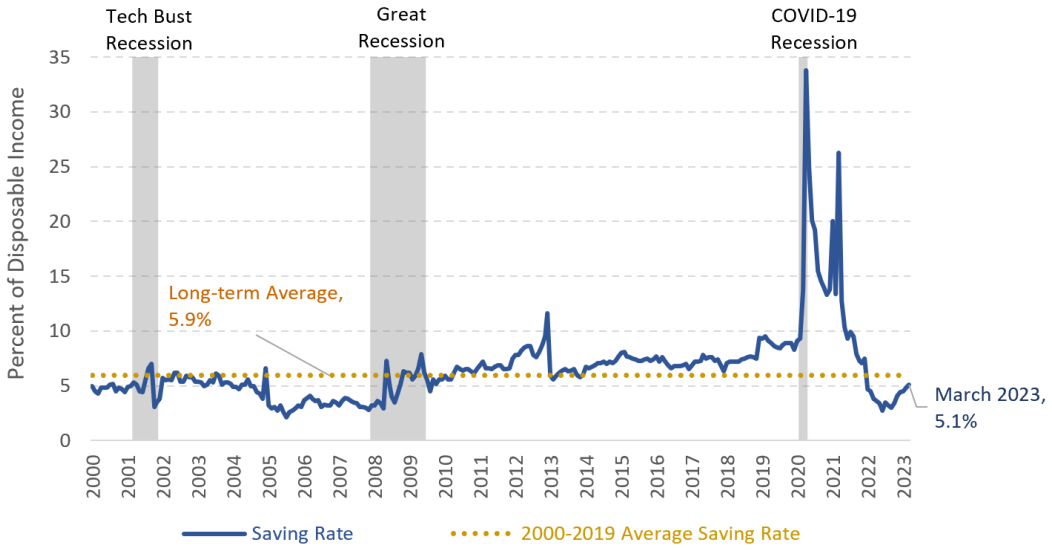
The personal saving rate soared during the pandemic. Social distancing curtailed household spending, and income transfers from COVID-19 relief packages[35] boosted household incomes. This resulted in trillions of accumulated savings. **Figure A-36** shows monthly personal savings as a percentage of disposable income from January 2000 to March 2023. The long-term average before the pandemic (2000-2019) was 5.9 percent. In 2020 and 2021, the personal saving rate reached levels above 30 percent, and households are estimated to have amassed a peak of more than 2.7 trillion dollars in excess savings through the end of 2021.

Accumulated savings have provided consumers with a cushion to sustain spending—including travel—amid price increases. However, the personal saving rate had fallen to a low 2.7 percent in June 2022, although it had slightly rebounded to 5.1 percent in March 2023. The cushion is shrinking as consumers dip more and add less to their savings to sustain spending. About two-thirds of the excess savings accumulated during the pandemic will be exhausted by the end of 2023—raising additional concerns about the ability of consumers to increase spending at the current pace.[36]

[35] COVID-19 relief packages were provided under the CARES Act in March 2020, the Consolidated Appropriations Act in December 2020, and the American Rescue Plan in March 2021.

[36] J. Pinsker, "Households Burn Through What's Left of Their Pandemic Savings," *The Wall Street Journal*, February 6, 2023.

Figure A-36 Personal Saving, Monthly, January 2000-March 2023



Sources: *U.S. Bureau of Economic Analysis and Unison Consulting, Inc.*

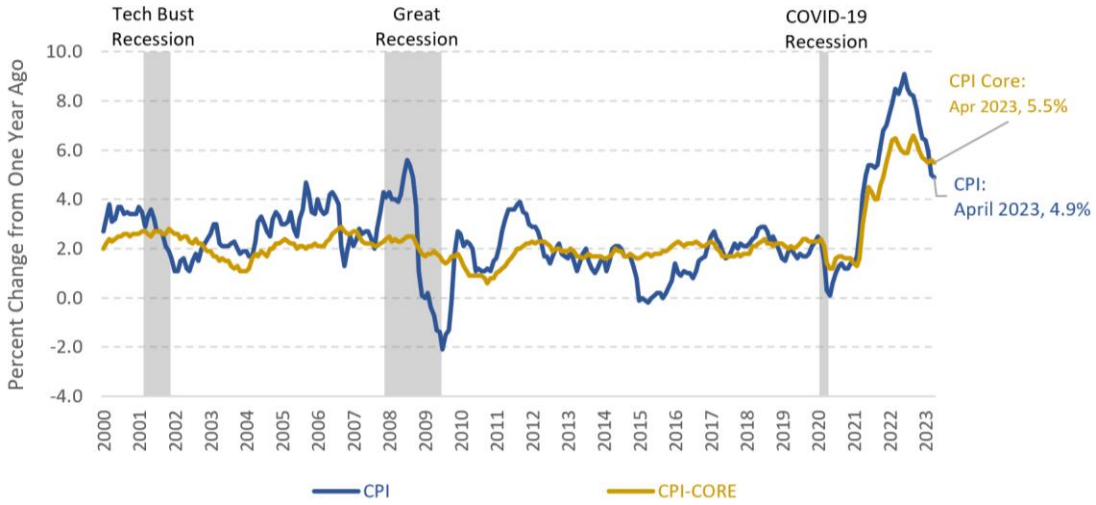
Note: *Gray areas indicate economic recession periods.*

Inflation

Strong consumer demand and supply constraints have created an inflationary environment. Inflation, which stayed mostly at or below 2 percent between 2010 and 2020, rose in 2022 to levels not seen since the early 1980s, as shown in **Figure A-37**. The headline inflation rate, measured by the All-Items Consumer Price Index (CPI), reached 9.1 percent in June 2022. Core inflation, which excludes highly price-volatile items like food and energy, has also been high, reaching 6.6 percent in September 2022. Inflation has eased slightly in early 2023 but is still well above the Federal Open Market Committee's (FOMC) long-term target of 2 percent. Core inflation has not fallen as much as the headline rate, straining household finances. High inflation reduces the purchasing power of consumers and erodes the impact of wage growth.[37]

[37] An alternative measure of inflation, the Personal Consumption Expenditures Price Index, calculated by the U.S. Bureau of Economic Analysis shows a similar pattern.

Figure A-37 Consumer Price Index, Monthly, January 2000-April 2023



Sources: *U.S. Bureau of Labor Statistics and Unison Consulting, Inc.*

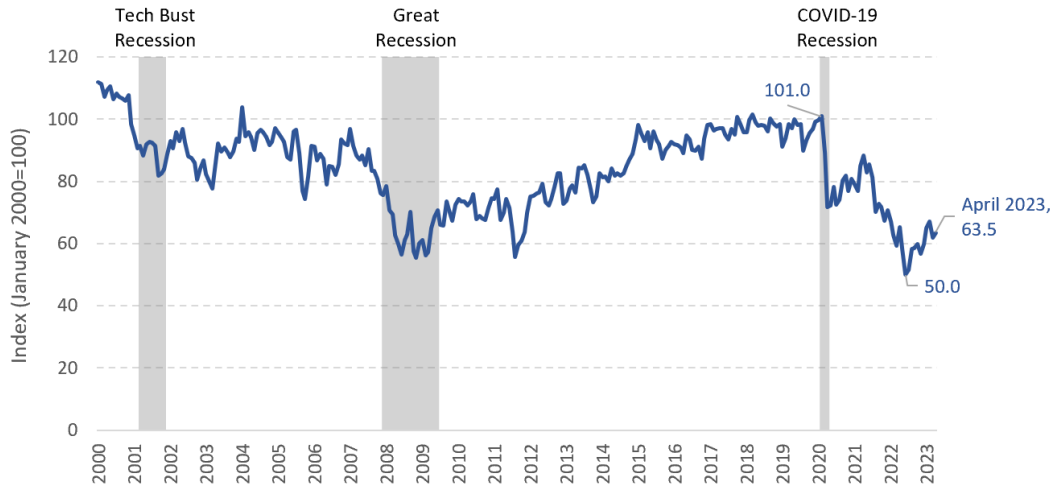
Note: *Gray areas are economic recession periods.*

Consumer Sentiment

Consumer sentiment, based on a recurring survey conducted by the University of Michigan, is near its lowest level in years—another indicator of caution regarding near-term economic conditions. As shown in **Figure A-38**, during 2022, the consumer sentiment index, which measures consumer confidence in the economy and suggests future demand behavior and business activity, fell to levels as low as those observed during the Great Recession.[38] Consumers are growing more concerned about high inflation and more uncertain about the near-term economic outlook.

[38] W. Huth et al., "The indexes of consumer sentiment and confidence: Leading or misleading guides to future buyer behavior," *Journal of Business Research*, March 1994.

Figure A-38 Consumer Sentiment, Monthly, January 2000-April 2023



Sources: *University of Michigan Consumer Sentiment Index and Unison Consulting, Inc.*

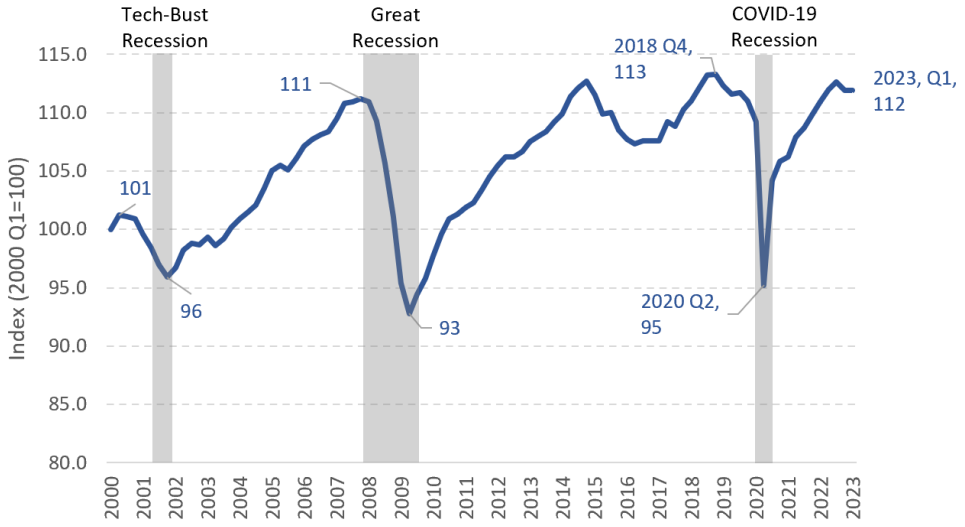
Industrial Production

Industrial production, which tracks the output of manufacturing, mining, and utilities (for example, power generation), tends to move in concert with business cycles. As shown in **Figure A-39**, industrial production decreased significantly during the last three recessions (2001, 2008-2009, and 2020). Most recently, it dropped about 19 percent from the fourth quarter of 2018 through the second quarter of 2020. By the second quarter of 2022, industrial production had rebounded to fourth quarter 2019 levels— a shorter recovery period than the seven years it took after the Great Recession. However, the trend took another downturn in the fourth quarter of 2022 when the index fell by 0.6 percent due to slowing demand, rising interest rates, and the high value of the dollar, which effectively increases prices for U.S. exports.[39, 40] Entering 2023, the industrial production index stayed flat in the first quarter.

[39] X. Fontdegloria, "U.S. Industrial Production Declined More Than Expected in December," *MarketWatch*, January 18, 2023, https://www.marketwatch.com/story/u-s-industrial-production-declined-more-than-expected-in-december-271674052883.

[40] Lucia Mutikani, "U.S. manufacturing output tumbles in December," Reuters, https://www.reuters.com/markets/us/us-manufacturing-output-tumbles-december-2023-01-18/.

Figure A-39 Industrial Production Index, Quarterly, Q1 2000-Q1 2023



Sources: *Board of Governors of the Federal Reserve and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Global Supply Chain

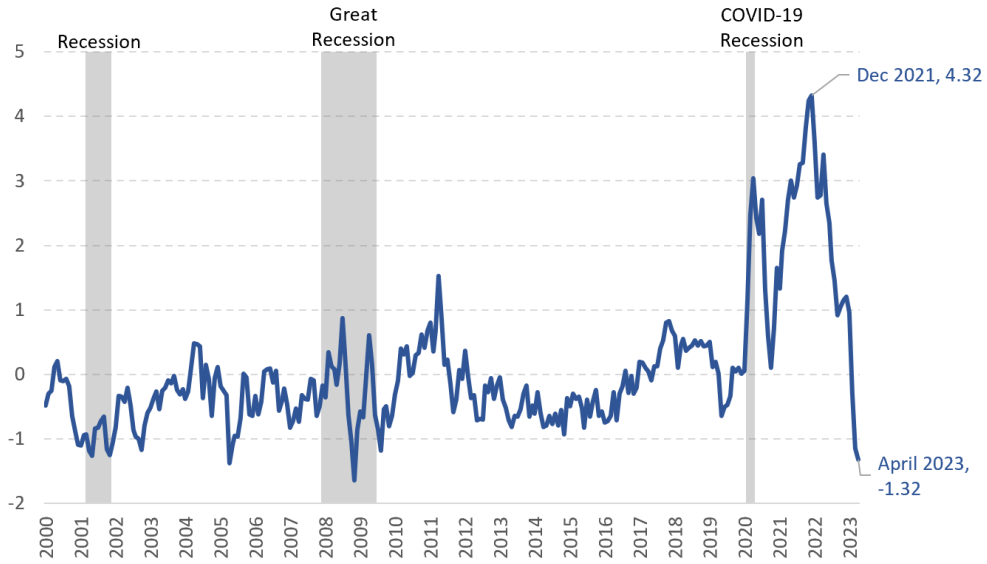
During the pandemic, the fragility of the global supply chain was exposed as COVID-19 led to the shutdown of factories across the globe, revealed transportation bottlenecks, and created a shortage of workers. Nearly all industries were impacted—manufacturing, construction, retail, and wholesale were among the hardest hit. Supply chain bottlenecks restricted the availability of raw materials, manufacturing capabilities, and product accessibility—eventually leading to price increases.

Figure A-40 shows the Federal Reserve Bank of New York's Global Supply Chain Pressure Index (GSPCI), which measures strain in the supply chain by combining a variety of transport cost measures with the Purchasing Manager Index. Higher values indicate more stress, while lower values indicate a system running smoothly. The index mostly hovered near zero over the past two decades. In 2020, however, the index rose to 3.0 and, after a brief fall, climbed even higher to 4.3 in December 2021. Since then, the index has again fallen to -1.32 in April 2023—a positive indication that the global logistics system is adapting to the demands of the post-pandemic era. While a smoother running global logistics sector may help economic growth, risks stemming from materials shortages, geopolitical tensions, and continuing changes in the geography of manufacturing will continue to threaten the stability of the global supply chain. [41,42]

[41] M. Derby, "NY Fed index shows global supply chain pressures eased further in March, Reuters, https://www.reuters.com/markets/ny-fed-index-shows-global-supply-chain-pressures-eased-further-march-2023-04-06/, April 6, 2023.

[42] KPMG, The Supply Chain Trends Shaking up 2023," https://kpmg.com/xx/en/home/insights/2022/12/the-supply-chain-trends-shaking-up-2023.html

Figure A-40 Global Supply Chain Pressure Index (Standard deviation from average), January 2000-April 2023



Sources: *Federal Reserve Bank of New York and Unison Consulting, Inc.*

Note: *Gray areas are economic recession periods.*

Summary: Macroeconomic Trends

The current macroeconomic picture is mixed. On the one hand, there are clear indications that the economy has significantly rebounded from the COVID-19 recession. On the other hand, warning signs suggest near-term economic instability. Consumer spending, while strong, has been bolstered by government programs that have now ended, and consumers are increasingly relying on debt. The personal saving rate, while rising, remains below the long-term average, and consumers expected future spending indicates a slowdown. While inflation has eased in 2023, it remains relatively high, while consumer sentiment remains relatively low. These trends are reflected in industrial production, which slowed in late 2022 because of increased costs and reduced demand, despite improvements in the global supply chain index.

MACROECONOMIC OUTLOOK

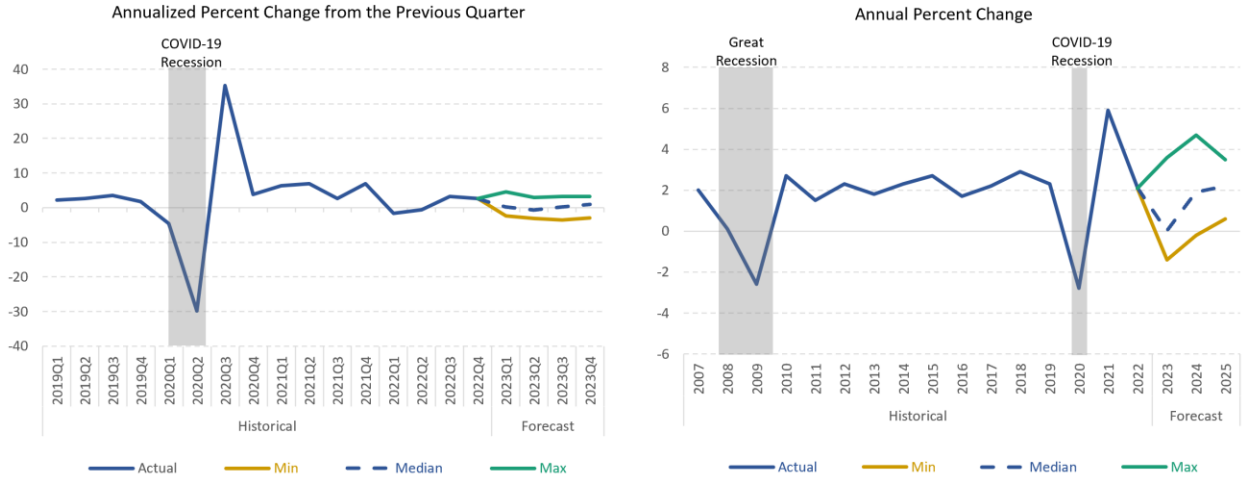
The COVID-19 pandemic has ebbed, but the U.S. economy is showing signs of slowing amid inflationary pressures, weakening consumer confidence, and tightening monetary policy. The FOMC has been actively raising interest rates in 2022 and 2023 to slow inflation. Between March 2022 and March 2023, the FOMC increased the Fed Funds rate nine times—by a total of 475 basis points (4.75 percent), increasing the cost of capital for individuals and corporations. A strong dollar, which is a sign of a strong economy, dampens demand for U.S. exports. Moreover, the global economy is also slowing—the International Monetary Fund (IMF) cut 2023 global growth forecasts, citing the effects of inflation, Russia's invasion of Ukraine, and

China's economic slowdown.[43] Over the long-term, however, history has proven the resilience of the U.S. economy—its ability to bounce from shocks and return to a growth trajectory.

Short-Term Outlook

Predictions are cautious about the short-term economic outlook. According to the median estimates from the Wall Street Journal (WSJ) April 2023 Economic Forecasting Survey, U.S. real GDP is forecast to grow 0.5 percent in the second quarter of 2023, -0.4 percent in the third quarter of 2023 and 0.5 percent in the fourth quarter of 2023, and 1.2 percent in the first quarter of 2024, as shown in **Figure A-41**. On an annual basis, the median estimate for GDP growth is 0.01 percent in 2023, 1.9 percent in 2024, and 2.2 percent in 2025. The range of predictions varies widely, including negative growth. The median estimate for the probability that the U.S. economy will slide into another recession within 12 months was 61 percent.[44] Other estimates are more pessimistic.[45, 46] For example, the Conference Board forecasts GDP contraction for the second, third and fourth quarters of 2023 and a return to growth in 2024.[47]

Figure A-41 U.S. Real GDP, Quarterly and Annual Change (Historical and Forecast)



Sources: *U.S. Bureau of Economic Analysis, Wall Street Journal February 2023 Economic Forecasting Survey, and Unison Consulting, Inc.*

Note: *Gray areas indicate economic recession periods.*

[43] Yuka Hayashi, "IMF Cuts 2023 Global Growth Forecast, Citing Inflation, War and China Slowdown," *The Wall Street Journal*, October 11, 2022.

[44] Based upon the predictions of surveyed economists.

[45] The Conference Board, "US Recession Probability Reaches 96 Percent Heading into Q4," *Navigating the Economic Storm*, September 29, 2022.

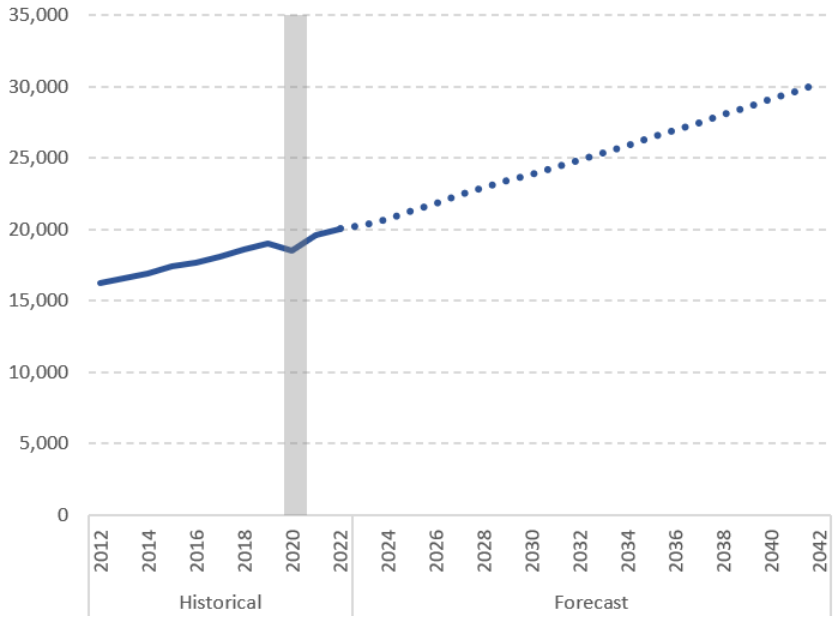
[46] Azhar Iqbal and Nicole Cervi, "Gonna Change My Way of Thinking: Is a Recession Coming? Part I: A New Toolkit to Predict Recessions," *Wells Fargo Economics Special Commentary*, September 23, 2022.

[47] The Conference Board, "The Conference Board Economic Forecast for the US Economy," March 15, 2023, https://www.conference-board.org/research/us-forecast.

Long-Term Outlook

Despite substantial economic uncertainty in the short- and medium-terms the U.S. economy is projected to return to a steady growth path. **Figure A-42** presents the long-term projected growth of US GDP. Between 2022 and 2042, Moody's Analytics forecasts the U.S. real GDP to grow 51 percent at a compound annual rate of 2.1 percent.

Figure A-42 Long-term Projected U.S. Real Gross Domestic Product (Billions of Dollars), 2012-2042

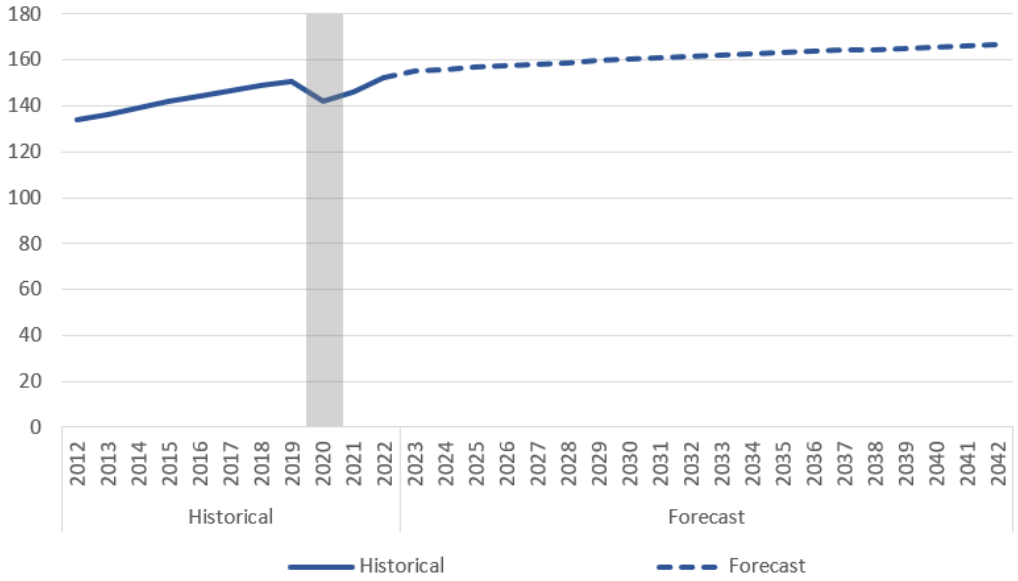


Sources: *U.S. Bureau of Economic Analysis, Moody's Analytics Baseline Forecast (February 2023), and Unison Consulting, Inc.*

Note: *Gray areas indicate economic recession periods.*

Figure A-43 shows historical and forecast employment. After falling by almost 6 percent between 2019 and 2020, non-farm employment exceeded pre-pandemic levels by the end of 2022. According to Moody's Analytics forecast, U.S. employment will gain over 14 million jobs between 2022 and 2042, increasing at a compound annual rate of about 0.5 percent.

Figure A-43 Historical and Forecast Nonfarm Employment (Millions), 2012-2042

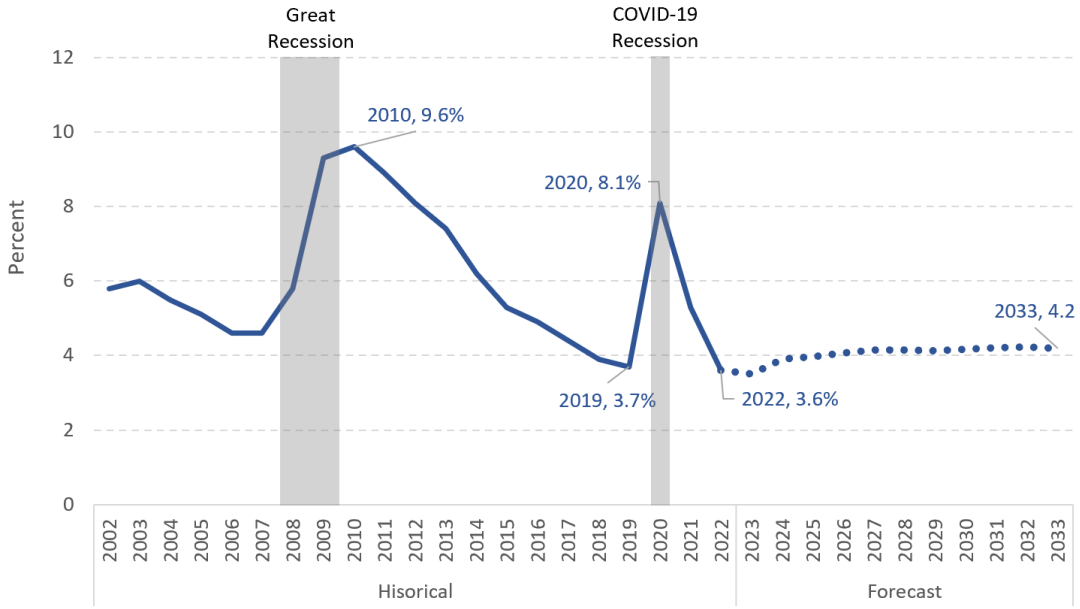


Sources: *U.S. Bureau of Economic Analysis, Moody's Analytics Baseline Forecast (February 2023), and Unison Consulting, Inc.*

Note: *Gray areas indicate economic recession periods.*

Moody's Analytics projects the U.S. unemployment rate to rise slightly above current levels to 4.2 percent by 2027, remaining nearly constant through 2033 at levels consistent with a full-employment economy. **Figure A-44** shows forecast annual unemployment rates with historical data from 2002 to provide a long-term perspective.

Figure A-44 Historical and Forecast Unemployment Rate, 2002-2033



Sources: *U.S. Bureau of labor Statistics, Moody's Analytics Baseline Forecast (February 2023), and Unison Consulting, Inc.*

Note: *Gray areas indicate economic recession periods.*

Outlook Summary

Economic signals in the Riverside MSA are generally positive. Population, real GDP, business establishment, and employment growth have been strong compared to California and the nation. In addition, the vital tourism industry has shown resiliency after the COVID-19 recession. Several industries in the Riverside MSA are poised to grow over the next decade. On the other hand, Riverside MSA residents generally have lower educational attainment and incomes than California and national averages. Living costs, while lower than nearby Los Angeles and San Diego, are higher than those for the average U.S. resident. Pro-cyclical industries, such as tourism, are particularly vulnerable to recession, and the state has already suffered due to layoffs (or labor disputes) in the technology, information, and logistics sectors.[48,49]

Macroeconomic trends show mixed signals, particularly in the short run. Supply-chain bottlenecks have eased, promoting more efficient production and distribution. Real GDP declined during the first half of 2022, and although it rebounded in the second half of the year, the probability of the U.S. economy going into another recession in the near-term is rising. Consumer spending remains strong, although consumer confidence has decreased due to inflation and recession worries. Rising interest rates—a consequence of Fed funds rate hikes to slow inflation—dampen housing demand and threaten capital investment. Despite recent announcements of layoffs in some sectors, the labor market remains strong for the time being. Beyond 2023 and 2024, the outlook remains positive, but international geopolitical tensions are a continuing concern for the global economy.

[48] K. Lee, "California Economy Is on Edge After Tech Layoffs and Studio Cutbacks," *The New York Times*, April 11, 2023.

[49] A. Zimmerman, "LA Port director expects 'real progress' in West Coast labor talks this spring," *Industry Dive*, https://www.supplychaindive.com/news/los-angeles-port-west-coast-labor-ilwu/643048/, February 21, 2023.

Appendix B – Sources of Forecast Risk and Uncertainty

OVERVIEW

The forecasts are based on information available at the time of the study, measurable factors that drive air traffic, and assumptions about their future trends. Actual results could differ materially from the forecasts if any assumptions do not hold or unexpected events cause traffic to decrease or increase significantly. The Airport operates in a dynamic business environment where a variety of factors are at play. Many of these factors, often intertwined, are subject to volatility and uncertainty, introducing risk—both downside and upside—to forecast activity levels.

DISEASE OUTBREAKS

Passenger air travel demand is sensitive to disease outbreaks. Disease outbreaks pose an unpredictable danger in various ways, such as customer confidence, health and safety, international travel policies, and the well-being and availability of sufficient staffing and labor. In 2020, the COVID-19 pandemic became a significant threat to the entire aviation industry and could remain a concern for some time. Widespread vaccination is key to containing the spread of the disease, restoring people's confidence in the public health and safety of air travel, and increasing people's comfort level with crowded spaces. The distribution of COVID-19 vaccines has aided the recovery of air travel and the overall U.S. economy. However, new variants of the disease, such as Delta and Omicron, and new waves of infection slowed the recovery process. Current COVID-19 infection levels sit among its lowest numbers throughout the pandemic, and the U.S. Department of Health and Human Services ended the COVID-19 Public Health Emergency as of May 11, 2023.[1] That said, continuous monitoring of COVID-19 continues to be essential to minimize serious illness, hospitalizations, and fatalities while maintaining public confidence.

ECONOMIC CONDITIONS

The aviation industry is pro-cyclical: aviation traffic grows during periods of economic expansion as consumer and business incomes grow, increasing overall demand, including for air travel. Conversely, aviation traffic declines during periods of economic recession, as consumer and business incomes fall, causing overall demand and the demand for air travel to fall.

[1] Centers for Disease Control and Prevention, "Evolution of Pandemic Efforts," *COVID Data Tracker Weekly Review*, February 24, 2023, https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html.

Various factors can trigger an economic recession. In 2020, the COVID-19 pandemic and the extreme mitigation measures triggered a global economic recession. The U.S. economy recovered to its pre-COVID output level in the second quarter of 2021 and has continued to grow, though at a slower pace. While the pandemic has eased, the U.S. economy faces other economic risks. In the short-term, inflationary pressures and supply constraints remain the most pressing concerns. International trade tensions, continuing geo-political tensions, weakness in portions of the global economy, financial market volatility, and the high level of U.S. government and private debt present economic risks for the U.S. economy. COVID-19 policies internationally have the potential to strain global supply chains, disrupt international trade, and hinder economic growth.

The growth of the U.S. economy faces several headwinds resulting from unfavorable, long-term demographic shifts, including population aging and declining population growth. An aging population will raise government expenditures on social programs and exert upward budgetary pressure on the U.S. government. This pressure will add to high U.S. government debt levels, which increased during the pandemic with federal programs aimed at alleviating the impacts of the pandemic on individuals and businesses. In addition, a dwindling population base could gradually reduce the overall demand for consumer goods, including the demand for air travel.

U.S. AIRLINE INDUSTRY VOLATILITY

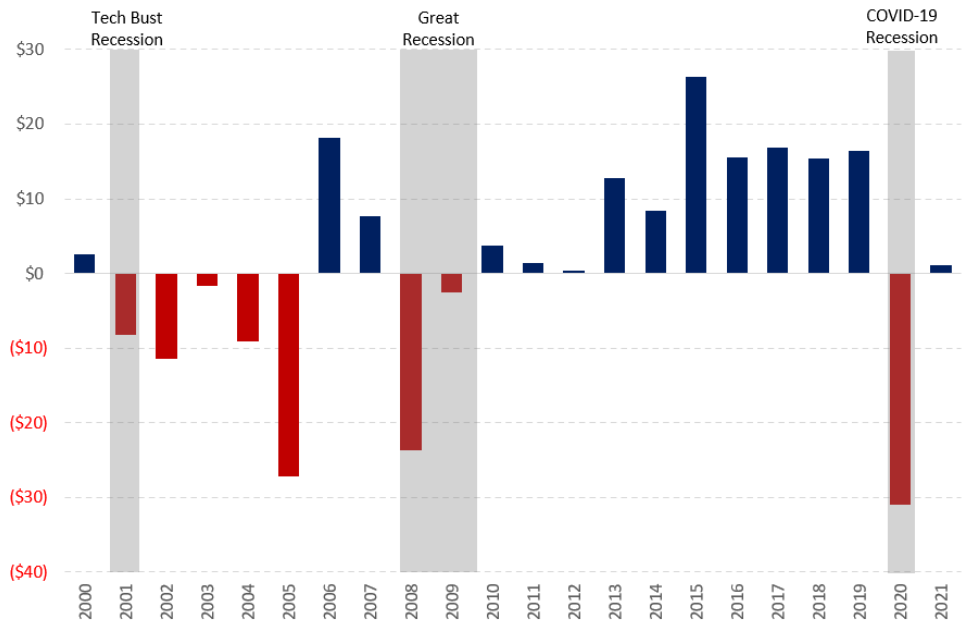
The U.S. airline industry is extremely volatile. It is vulnerable to many exogenous factors, such as economic downturns, sharp increases in oil prices, adverse weather, disease outbreaks, travel restrictions, terrorism threats, and geopolitical tensions. The volatility is reflected in the U.S. airline industry's balance sheet.

Over the two decades before the pandemic, the U.S. scheduled passenger airline industry incurred annual net losses in 7 years, netting a profit of $61.2 billion over the 20 years from 2000 through 2019, as shown in **Figure B-1**. After persistent losses during most of the 2000s, the U.S. scheduled passenger airline industry realized net profits almost yearly during the 2010s. The industry thrived amid the long economic expansion during the 2010s and the sharp decrease in fuel prices. The industry also reaped benefits from several business improvements made during the 2008-2009 Great Recession, including cost-cutting and productivity-enhancement measures. The improved financial performance enabled U.S. airlines to renew their fleets, increase scheduled flights and seats, and reduce capacity constraints.

In 2020, the U.S. scheduled passenger airline industry outlook took a dramatic downturn with the spread of COVID-19. **Figure B-2** shows the net income quarterly during the COVID-19 economic downturn. As air travel slowed dramatically in the first half of 2020, U.S. scheduled passenger airlines incurred an annual net loss of more than $35 billion, the largest annual loss since 1977. However, in 2021, as air travel resumed, the industry began to recuperate some losses incurred in the previous year, operating a $1.2 billion profit. To alleviate the negative financial impact of the COVID-19 pandemic on U.S. airlines' finances, the U.S. federal government provided financial relief to the U.S. airlines in three federal aid

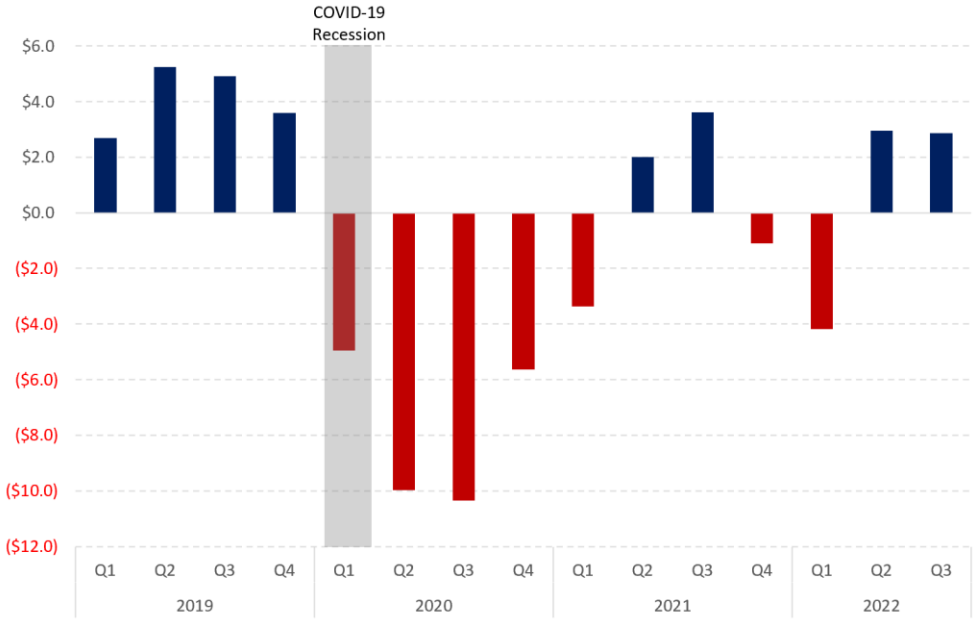
packages: the Coronavirus Aid, Relief, and Economic Security Act (CARES Act); the Coronavirus Response and Relief Supplemental Appropriations Act (CRRSA); and the American Rescue Plan Act of 2021 (ARPA).

Figure B-1 Annual Net Income ($ Billions), U.S. Scheduled Airlines, 2000-2021



Source: *U.S. Bureau of Transportation Statistics (Form 41 Schedule P-1.2); Unison Consulting, Inc.*
Note: *Gray areas indicate economic recession periods.*

Figure B-2 Quarterly Net Income ($ Billions), U.S. Scheduled Airlines, Q1 2019-Q3 2022



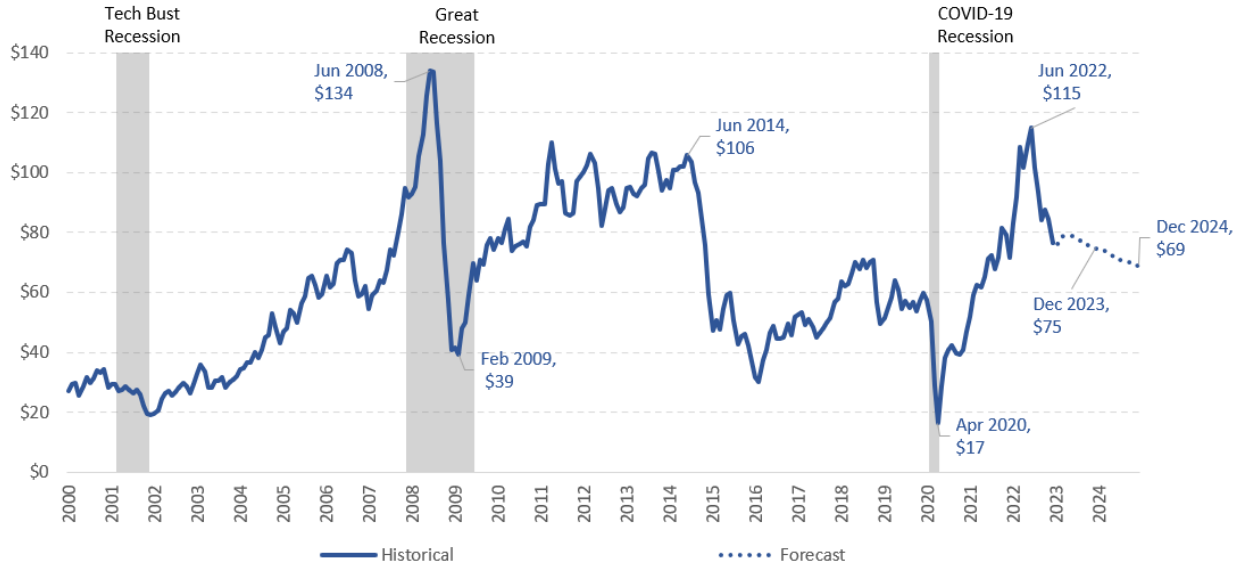
Source: *U.S. Bureau of Transportation Statistics (Form 41 Schedule P-1.2); Unison Consulting, Inc.*
Note: *Gray areas indicate economic recession periods.*

VOLATILITY OF OIL PRICES AND IMPLICATIONS FOR AVIATION FUEL COST

Volatility in oil prices directly affects aviation fuel costs, a significant component of airlines' operating costs (the correlation between prices is 0.95).[2] Increases in the price of oil, therefore, translate directly into higher airline fuel costs. Crude oil prices are presented in **Figure B-3,** and the price of aviation fuel in **Figure B-4**. In the 2000s, record oil price increases raised fuel costs, pressured airlines' finances, and contributed to extensive net losses industry-wide. However, oil prices fell steeply by 2015, contributing to sustained profitability in the U.S. airline industry in the 2010s.

In 2020, the global economic recession and the oil supply glut kept oil prices low. As a result, airlines enjoyed low fuel prices, providing some cost relief during the pandemic. In 2021, the global economic recovery began to push oil prices up. Oil prices rose to a high of $115 per barrel in June 2022, exacerbated by the Russia-Ukraine conflict. By December, prices had fallen to $75 per barrel and are currently forecast to decline to under $70 per barrel through 2024. Nevertheless, oil prices will continue to be affected by changing global economic conditions, geopolitical factors, and the unpredictability of actions taken by the Organization of the Petroleum Exporting Countries (OPEC).

Figure B-3 **Crude Oil Price, West Texas Intermediate, $/Barrel, January 2000-December 2022 (Forecast to December 2024)**

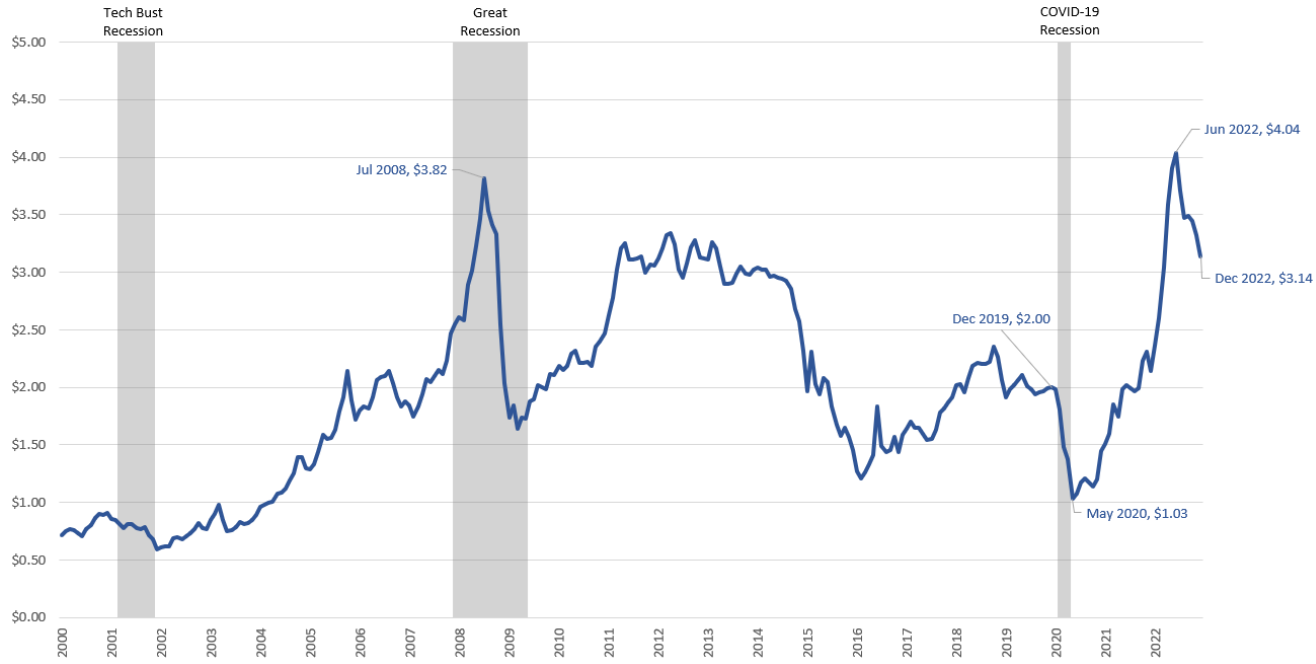


Source: *U.S. Energy Administration; Unison Consulting, Inc.*

Note: *Gray areas indicate economic recession periods.*

[2] Based on data from the U.S. Energy Administration and U.S. Bureau of Transportation Statistics and calculations by Unison Consulting, Inc.

Figure B-4 Aviation Fuel, Price per Gallon, Monthly, 2000-2022



Source: *U.S. Bureau of Transportation Statistics; Unison Consulting, Inc.*

Note: *Gray areas indicate economic recession periods.*

AIRLINE MARKET CONCENTRATION

Airline market concentration raises concerns if it could lead to the abuse of market power or excessive price increases. Monopoly market power is less of a concern at PSP given the relatively even distribution of market shares among airlines. Alaska Airlines, the largest carrier in terms of market share, made up about 22 percent of the Airport's total enplanements in 2022, declining from a high share of 27 percent in 2020. Alaska's share decline was partly due to Southwest's entry in 2020, whose market share increased from 1 percent in 2020 to 18 percent in 2021 and 2022—just slightly behind American Airlines' second largest market share of a little over 18 percent in 2022. No other airlines had more than 18 percent market share in 2022.

AIRLINE ECONOMICS, COMPETITION, AND AIRFARES

Airfares have an important effect on passenger demand, particularly for relatively short trips where the automobile (or occasional bus or train) is a viable alternative. Fare levels are also particularly impactful for price-sensitive "discretionary" travel, such as vacation travel. Airfares are influenced by airline operating costs and debt burden, passenger demand, capacity and yield management, market presence, and competition. The aviation activity forecasts for the Airport assume that, over the long term, annual increases in airfares will not exceed annual inflation. If they do, the increases in airfares would dampen forecast traffic growth.

AIRLINE MERGERS

Over the long run, the airline industry has been consolidating in response to competition, cost, and regulatory pressure. Airline mergers affect service and traffic at airports when they consolidate facilities, optimize route networks, and route connecting traffic through other hubs. The impact on affected airports usually happens within a few years—sometimes immediately—following a merger. The impact can be significant or trivial, depending on whether the merging airlines have a large market share at an airport and whether they carry significant connecting traffic through the airport.

STRUCTURAL CHANGES IN DEMAND AND SUPPLY

Historically, major crises have prompted lasting structural changes in the aviation industry's demand and supply. For example, the 2001 terrorist attacks prompted more stringent airport security measures requiring passengers to arrive at the airport much earlier for departing flights. This reduced some of the time advantages of air travel over ground transportation for short-haul flights. The COVID-19 pandemic brought about significant effects on the aviation industry, some of which could be structural and permanent.

On the demand side, COVID-19 could usher in a "new normal" in consumer behavior, social interactions, and business methods that would permanently alter travel propensities and preferences. Public health and safety concerns may influence customers to consider ground transportation for longer distances previously traveled by air. For vacation travel, consumers are adapting to the COVID-19 environment by favoring destinations accessible by ground transportation. The accelerated adoption of technology for virtual meetings and conferences could result in a permanent downshift in business travel demand. These shifts in air travel demand can potentially delay the revitalization of the industry to pre-COVID traffic and growth levels.

On the supply side, U.S. airlines have taken steps to become smaller—accelerating the retirement of old aircraft, deferring new aircraft orders, and cutting workforces during the worst period of the COVID-19 pandemic. However, the streamlined fleet and workforce have constrained U.S. airlines in restoring adequate capacity to accommodate the strong rebound in air travel demand. Moreover, it could take years for U.S. airlines to resolve these capacity constraints amid supply chain problems in aircraft manufacturing, a pilot shortage, and an overall shortage in labor supply.

One favorable trend is the accelerated adoption of no-touch technologies by airlines, airports, and the TSA. These new technologies will help allay public health and safety concerns and speed up passenger processing. By saving passengers time and reducing uncertainty, these technologies could help restore the competitiveness of air travel against ground transportation and stimulate traffic recovery and growth.

LABOR SUPPLY CONSTRAINTS

The COVID-19 pandemic and resulting recession led to employee layoffs across many airlines, and companies went into 2021 with a significantly smaller workforce than they had before the pandemic. In addition, the demand for leisure travel accelerated in the first half of 2021, requiring airlines to adjust their workforce to meet demand. As a result, insufficient numbers of qualified employees could limit the airlines' ability to provide an adequate supply of flights and seats and, by extension, slow overall air traffic growth. Competition between companies to attract and retain skilled personnel has intensified and threatens to further impact industry growth.

Pilot shortages are a significant concern for U.S. airlines. Several factors contribute to the shortage of pilots. First, approximately 5,000 experienced pilots accepted early retirement in response to airlines' desire to cut staff during the pandemic. Second, many pilots historically gained their training via military service. However, the use of drones and reductions in military staff has limited that pathway. Third, the aviation industry is heavily gender-biased (women comprise only about 5 percent of the global pilot workforce). This failure to diversify severely reduces the size of the pilot labor force. Fourth, the working conditions and initial pay for new pilots are discouraging. The substantial investments in time, money, and experience required to become a pilot can be a disincentive to joining the industry.

GEOPOLITICAL CONFLICTS AND THE THREAT OF TERRORISM

Geopolitical conflicts and acts of terrorism disrupt air transportation. The terrorist attacks of September 11, 2001, serve as a constant reminder of the severe threat that such acts have on the aviation industry. Travel threats and warnings elevate airport security measures, resulting in more meticulous passenger screening, longer waits at security screening lines, and increased passenger anxiety—all discouraging air travel.

The Russian invasion of Ukraine is the latest example of a geopolitical conflict affecting air transportation. The United States, Canada, and the European Union have closed their airspace to Russian aircraft. In retaliation, Russia has limited the use of its airspace to the airlines of many countries. These constraints have significantly impacted flight routes and flight times for global travel.